# THE AUTOMOBILE



WEEKLY NEW YORK—SATURDAY, JANUARY 3, 1903—CHICAGO 10 CENTS

## Mid-Wintering In Savannah.

SNOW inches deep on the roads of the North, and wintry blasts from the Northwest nipping the feet and fingers and noses and ears of all who venture to indulge their passion for motoring at this season in the New England, Middle Atlantic and North Central States, cause the thoughts to turn naturally and irrepressibly to places in a milder clime where motoring in winter is unaccompanied by these concomitant discomforts. Only fifty hours by boat from New York, Savannah offers all that is needed for two months of keenest enjoyment and rest by the motorist from the North—mild sunny weather in February and March, many miles of unsurpassed roads, the most hospitable of people, excellent hotels, fine boating, good hunting and fishing, and good and cheap facilities for the care and repair of automobiles. Added to these are blooming flowers in midwinter, picturesque old southern plantations and the primitive simplicity and exuberant spirits of the negro population

There may be and undoubtedly are many other places in the South that offer equal or greater natural attractions, and other places that are more popular and more frequented by winter tourists from the North, but Savannah is especially deserving of the attention of automobilists because while old and quaint and imbued

UNDER THE OAKS AT SAVANNAH, GEORGIA—A WINTER RESORT WITH GOOD ROADS FOR AUTOMOBILISTS.

with the southern languor so restful and pleasing to the overworked and nervous Northerner, she leads her sister cities in the appreciation of the advantages of good roads and is among the first to offer a hearty and unrestricted welcome to motorists.

A PIONEER FROM NEW YORK.

A suggestion of the "atmosphere" and charm of winter motoring at Savannah is contained in the photograph herewith reproduced of the Rainey party taken there last February when pedestrians in New York were carefully picking their way on heel and toe through slush ankle deep in the streets and recklessly courting pneumonia. This little party may be considered the vanguard of northern motorists in Savannah. They were induced to go down last winter by Dr. E. M. Brandt, of New York, who has spent his winters there for a number of years. And so well pleased were they with the treatment accorded them by the citizens and by the natural charms of the city and surrounding country that several of them expect to go down again this winter and will probably be joined by others.

In the party shown in the picture are Mr. H. C. Baxter, of Brunswick, Me., and Dr. E. M. Brandt, of New York, in the Winton at the left; W. T. Rainey, of New York, at the wheel of the Panhard in the center; Julian Schley, of Savannah, at his left and Carl Blenner, of New York, in the tonneau; R. A. Rainey, of New York, at the wheel of the Panhard at the right; Arthur Whitney, of New York, at his side and Dr. Hawkins, of Savannah, in the right hand seat of the tonneau. When the party first went to Savannah with their big touring cars, which were about the first of the kind seen there, their appearance in the streets scared many of the horses, but the residents were good natured about it and soon the animals became accustomed to the unusual sights and showed less alarm. There was no opposition to the machines and no petty annoyance and interference by the police.

ROADS EQUAL TO THOSE OF FRANCE.

The streets of Savannah and the country roads leading out of the city are well paved, the latter being built of shells with a top surfacing of chert, a flinty quartz brought from some distance inland. These roads look like limestone highways and are the equal of any in France, according to Dr. T. J. Charlton, of Savannah, who knows from personal experience, having tried both. The chert road has a smooth, hard, gravel-like surface which dries rapidly, being practically dry and free from mud within an hour after a hard rain. Work is now far advanced, writes Dr. Charlton, on a road which when completed will give a semi-circular drive of more than twenty miles, taking in a number of the city's most popular suburban resorts. These roads are built by convicts, several hundred of whom are kept busy in the work both summer and winter. Thus Savannah's roads cost less to build than those in the North and she is pushing the work energetically.

"One of the interesting sights about Savannah," said Mr. W. T. Rainey last Saturday, "is the chain gang at work on the road. They are comprised mostly of negroes, joking and laughing and singing, true to their nature, despite the chains fastened to iron rings welded around their ankles and, while at work, tied up at the middle to belts around their waists. At night the chains are untied and a long chain is run through rings in them, fastening the whole gang together. They sleep in camps by the road where they are at work. In the daytime they work under a couple of guards armed with Winchester rifles, and there is no 'fooling,' for they know if a guard shoots he shoots to kill. And they are kept strictly at work, notwithstanding their pleasantries.

"The chert roads extend in various directions from the city to resorts on the Savannah river and along the coast. At present they do not connect, unfortunately, with any other important cities, but when you come to the end of a good road you drop off abruptly into deep sand. However, they are building a road toward Charleston now, and as Charleston is also actively engaged in road improvement it is hoped that the two cities will be connected by a road at no distant day.

SEA VOYAGE PLEASANT.

"If I were not going to Europe this winter, partly on business, I should certainly go down to Savannah again this winter," continued Mr. Rainey, enthusiastically. "I don't know of any place in the country where a man with an automobile can have a better time. He can take his machine down to the dock in New York and run her through the side of one of the Savannah Line steamers, where she will be lashed in place, and when Savannah is reached she can be run out, the engine started and the car driven to one of the automobile storage and repair stations. The transportation charge for a slight runabout is $15, while a heavy touring car can be taken down for $20. The ocean trip is a delightful one of fifty hours. The steamers are commodious and well appointed, the staterooms large and comfortable, and the officers most courteous and agreeable. Everything is done to make the voyage a pleasant one. As to the cost of the trip, it is about 30 per cent. cheaper than by rail.

BOATING, FISHING AND HUNTING.

"There are a number of excellent hotels in Savannah, some of them new and large. We received the best of treatment, good fare and first rate accommodations. As soon as we arrived invitations were sent us by the half dozen good clubs in the city and all the time we were there we enjoyed the freest hospitality, for which the South is so famed. They have a very good yacht club, where we were entertained, and the boating on the river and bays is delightful. One can get a boat at the yacht club and go to many beautiful places on the river, one that I remember especially being White Bluff, where you can get the finest of terrapin soup with a turtle foot in it as a guarantee of genuineness. I never knew what terrapin was until we ate it there. And you can get about thirty-five different courses of sea and river food there. Another place on the river that can be reached either by boat or by automobile over a new road is Montgomery, a pretty suburban resort on a high bluff. Tybee, at the mouth of the river, is another popular resort, where you can have oyster roasts. It is about ten or twelve miles from the city. Then there is fishing of all kinds, and on the Sea Islands, famed for fine cotton, there is deer hunting and plenty of duck, snipe and quail shooting in season. These islands are largely owned by wealthy residents of Savannah. We spent a week at one place, where we were treated royally and were urged to stay longer.

"In town there are beautiful parks full of flowers and fine old trees, and there are lots of pretty girls, all of which help to make a winter there so charming. In many places the giant live oaks spread out clear across the roads and you can look away down delightful vistas that invite the automobilist onward past picturesque old rice plantations and colonial mansions and the humble but interesting cabins of the simple negroes.

LAUNCH ADDS TO PLEASURE.

"If one has a launch that he can take down with him, together with his automobile, he can double his pleasure, for even the most enthusiastic motorist will not want to drive his machine on the roads every day, and by way of variety he can spend many days full of interest and pleasure on the river and bays.

"There are two well equipped automobile stations in the city where one can have his car repaired and cared for by experts at reasonable prices; in fact, when I asked for my bill at one of them before I came away, I was surprised to find that it amounted to only about 30 or 40 per cent. of what I expected.

"Anybody who goes down there," concluded Mr. Rainey, "will find plenty to do and enough to interest him for a couple of months."

## Motor Buses Displace Carettes.

A line of motor busses was started on December 10 on the North Side of Chicago, on North State, Rush and River Streets, Wabash Avenue and State Street to Adams Street. These machines displace the familiar horse-drawn carette which has heretofore carried most of the traffic on these thoroughfares.

# The Paris Salon in Text and Pictures.

## A Running Account of Things and Incidents which Bear upon the Development of Automobilism in the United States or Illustrate the Special Condition of the Automobile Movement in France.

*[Compiled from Mail Advices by Staff Correspondents.]*

Until the opening of the Madison Square Garden exhibition the Salon de l'Automobile in Paris remains the center of interest for automobilists. But the importance of the French Show for this country lies more in the technical suggestions which it supplies than in the French leadership in matters of style, for there are now many indications tending to show that American manufacturers will display so great a variety of carriage styles at the New York event that those which may be borrowed from Europe—and many of these will have been anticipated here—will be less dominating than generally expected.

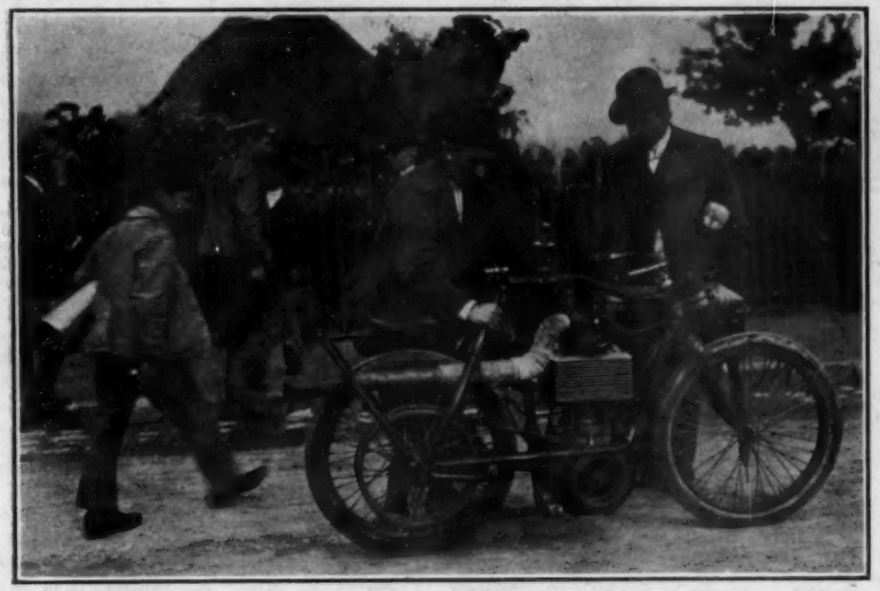
The leading novelties in mechanical construction shown by the French industry have already been referred to in the last two issues of THE AUTOMOBILE, and will be treated again more at length by the staff correspondents in Paris. One of these letters will be found on another page.

Aside from the significance of the Paris Show as a source of styles and fashions and a repository for mechanical innovations, showing the ingenuity of engineers and the progress of motor vehicle art and science, this great display has social and artistic features which are intimately connected with the political conditions of Europe and to which nothing of corresponding magnitude can possibly be produced here. Nothing equal in size and architecture to the Grand Palais is obtainable as a setting for an automobile show in New York, much less a building of this character located on broad and famous thoroughfares like the *Champs Elysées* and *Avenue Nicolas*. No kings will be ceremoniously conducted from stand to stand at the Madison Square Garden as was King Leopold of Belgium on two successive days at the Paris Show. Our president and his cabinet may not be relied upon to grace our exhibitions with their presence, as automobilism has not become a concern of our government as it has in France. Our industry is scattered and is not in daily touch with the world of art, while the principal French manufacturers are located in the vicinity of Paris and have the most abundant facilities for disposing over artistic talent of high order for the arrangement and decoration of stands.

MORNING HOURS IN FRONT OF THE GRAND PALAIS.

All that is implied in this difference of conditions—the *milieu*, as the French call it—lends luster, dignity and exhilaration to the *Salon d l'Automobile*, and bribes the eye and ear of visitors, so that they are likely to ascribe a greater significance to what they see than cool judgment would approve of. As explained last week many of the innovations of the Paris display are of non-French origin, some of the most important ones being adaptations of American ideas; yet viewed in the Parisian setting they have taken on new importance in the eyes of the world, though their intrinsic merit has not been increased in any sense. Much to which reference has been made is apparently still in the experimental stage, such as the 8-cylinder motor of the C. G. & V. firm, the vehicles with electric transmission, the new air-throttling carbureters. From across the Atlantic such features, as reported by enthusiastic visitors dazzled by the magnificence of the Show, appear at first as progress accomplished and verified.

Much is made of the fact that two or three leading manufacturers of France have adopted the three-cylinder motor for machines of medium horse power and claim a distinct gain in absence of vibra-



THE CLEMENT 14-HORSEPOWER MOTOR BICYCLE

Which started the rumor that the police would insist on two brakes on the rear wheel of motor bicycles.

tion and simplicity. Even American visitors look upon this as an important new principle, though the arguments for this type of motor are identical with those advanced for a number of years by Charles E. Duryea, of this country. Only from the French themselves is there heard voices who admit that the new practice is old in the United States. One thing may be said, however, on this point indicating some method in the lateness of the French in discovering the virtues of triple cylinders. The construction was not so commendable so long as electric ignition was more or less precarious, because the failure of one of the cylinders to explode its charge would interrupt the regular rhythm of power impulses. Now that ignition by magneto or magneto and battery has safeguarded this function, the three-cylinder construction takes possession of its birthrights. Perhaps the French discovered this timeliness.

MILES 93 WITH SERPOLLET'S CANOE.

The famous "Whale" which made new records for the Gardner-Serpollet firm in 1902 has a successor of still more extreme form, with a view to a decrease of air resistance and an increase of stability. The strongly built châssis is placed very low, and the wheel base is 2.50 meters—8 feet 2 1-2 inches in length. The body of the car, which is similar to a canoe turned upside down, has an oval opening for the driver.

The boiler, which is placed very low, has a smaller number of tubes than in the "Whale," but their increased length gives an added area of heating surface. An important change has been made in the control of the pumps, the well-known cam movement being replaced by an eccentric and slide operated from the rock shaft of the automatic pumps. By this means the driver has under his command a wide range of variation in the stroke of the pumps.

The small handles on the steering column for operating the pumps and the variable speed gears have been replaced by two substantial levers within convenient reach of the hand. The chain tighteners are carried directly to prolongations of the rear springs. This novel machine, from which new speed records may be expected in the coming year, is of 40 horse power.

When President Loubet, on the opening day, learned from Mr. Serpollet that this machine was intended for a speed of 150 kilometers per hour, he thought it was a joke, but reassured that such was the actual speed capacity, he asked: "But where can you drive at that pace?" "On the *promenade des Anglais* at Nice," answered Mr. Serpollet respectfully. This is where the "Whale" was driven at 121 kilometers in 1902. Few doubt that the new machine will actually go at over 90 miles per hour, but whether anybody will dare to drive it so fast is another question.

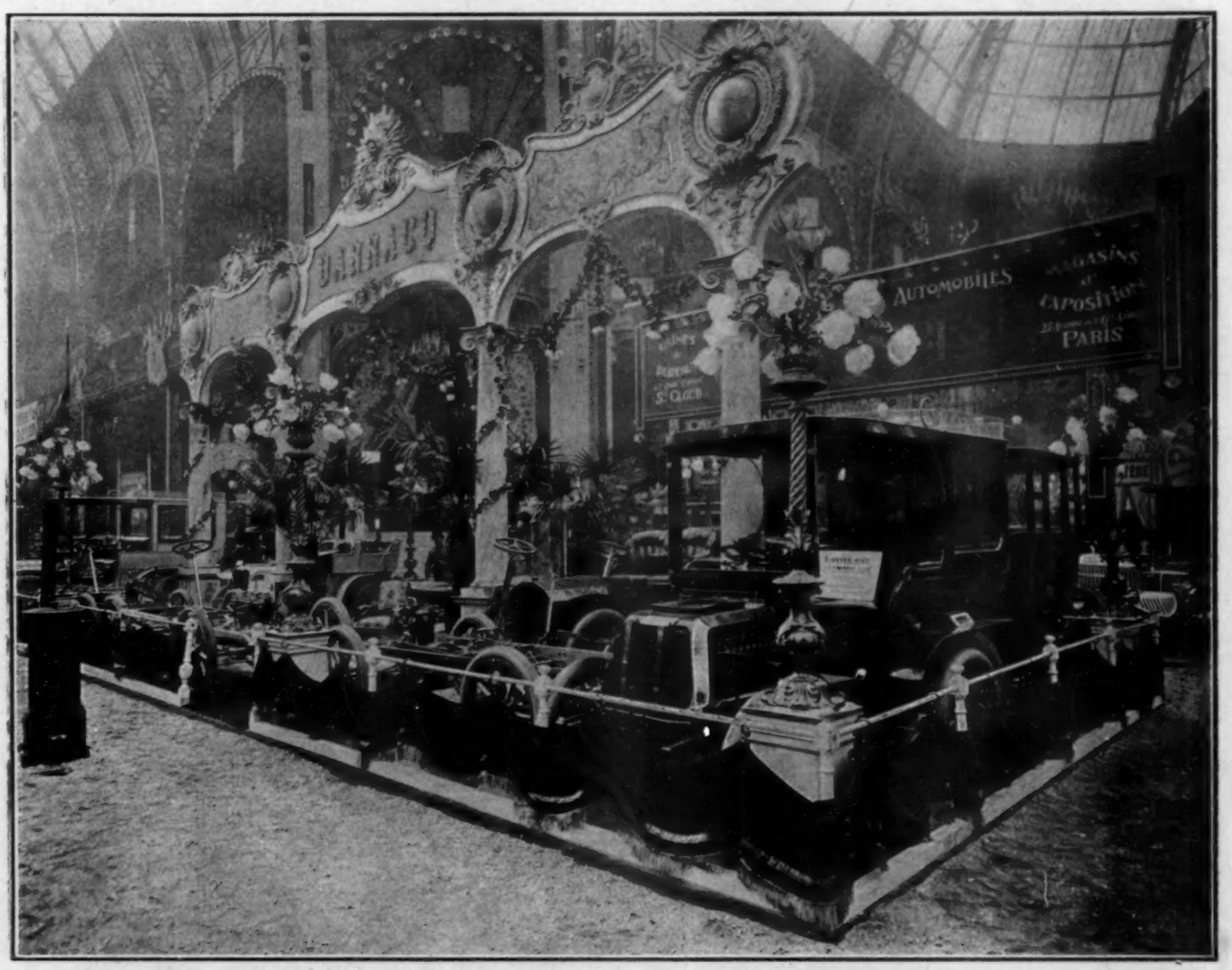

**GARNDER-SERPOLLET, THE ONLY PROMINENT FRENCH FIRM BUILDING STEAM PLEASURE AND RACING CARS.**

Its founder is Leon Serpollet, 35 years old, who has adhered steadfastly to the flash-boiler steam system from the beginning, and is one of the oldest manufacturers of automobiles in France, in spite of his youth, and the first man to obtain a permit to drive a motor vehicle in the streets of Paris. His cars now hold all speed records of the world. In the foreground is seen his new speed car intended to go 150 miles per hour. In the background is the stand of Panhard et Levassor built as a Greek Temple with Ionian columns. To the right the stand of Werner Brothers whose motor bicycles earned the only medal for regularity of operation in the Paris-Vienna race in competition with automobiles of all kinds.

ALL GEARS ON REAR AXLE.

A machine built by C. E. Henriod is beginning to attract much notice. Between the motor shaft and the rear axle there is no other mechanism than the clutch in the flywheel and a long shaft with the usual cardan joints. All the va-

riable-gear mechanism is on the rear axle together with the differential gear. The latter is of the usual design. The variable speed gearing is very compact, but drawings of it are not yet obtainable, but nothing coming from Mr. Henriod can be dismissed as impracticable. He employed air-cooled motors up to 6 horse power for each cylinder with more success than anyone else and is prominent among those who obtained excellent results from al-




**WHERE DARRACQ MACHINES ARE SHOWN AT THE GRAND PALAIS.**

Darracq cars have taken a strong place in all contests and races of the past year. He now builds machines of 40 to 50 horsepower, and for one of these large cars has adopted the ashionable multitubular radiator with fan, tut gives it a slight rake which improves its appearance. In all Darracq cars the aim of the builder is for simplicity and strength, rather than for extreme refinement. His 12-horsepower two-cylinder machine, which takes the place of his 9-horsepower one-cylinder machine of 1902, is now manufactured "in series," that is, in quantities permitting economical production. In the aisle is seen one of the little hard coal stoves which fail to raise the temperature in the Palais much above the freezing point.

cohol. The idea of his "Universal" rear axle is to permit the small builder or assembler to make automobiles of low price and fair quality. He can select any motor he likes, build the vehicle in any style, and all he needs, additionally, is to buy Henriod's combined speed gear and differential shaft. He can hardly blunder in putting these components together, while at present he is most likely to do so.

This is the dream, and it may be realized. At all events the assemblers will have small chance in the market, unless something on this order proves practicable; for public opinion is settling so decidedly in favor of certain models of each organ in an automobile that the assembler really has little choice. He is compelled to buy certain patterns of each organ if he shall have any hope of selling his product, and these certain patterns come high. In combining them in a vehicle he is likely to commit serious errors of judgment, and after all he is unable to sell at a low figure.

### SINISTER JOKING BY POLICE.

Some of the motor bicycles at the Show are equipped with motors of considerable power. When Mr. Hommen, who is the motor expert of the Parisian police, had seen them, he resolved that they were as dangerous in the street traffic as the more ponderous racing machines and gave vent to a remark which caused consternation. "These bicycles will hereafter have to be fitted with two brakes on the rear wheel and one on the front wheel," was the wording attributed to him, and rumor was busy with the incident for a whole day, cartoons following the next, but nobody felt quite sure but what the police might really demand two brakes on the rear wheel of a bicycle.

Among the most costly machines are the Rochet cars; $2,600 (in France) for a four-cylinder vehicle, $2,000 for one equipped with two-cylinder motor. This is as high as the most fashionable manufactures. The workmanship and the small production explains it. "It has become practically impossible to obtain enough first-class workmen," says the manufacturer, "to combine quantity and quality." But nearly all other manufacturers of note are placing less and less dependence in manual skill. They buy new machinery, largely in the United States, and manufacture "in series;" that is, they make up

their minds that they can sell 500 or 1,000 vehicles of one model and then organize their shops for its economical production, exactly as American manufacturers of steam vehicles have done for years.

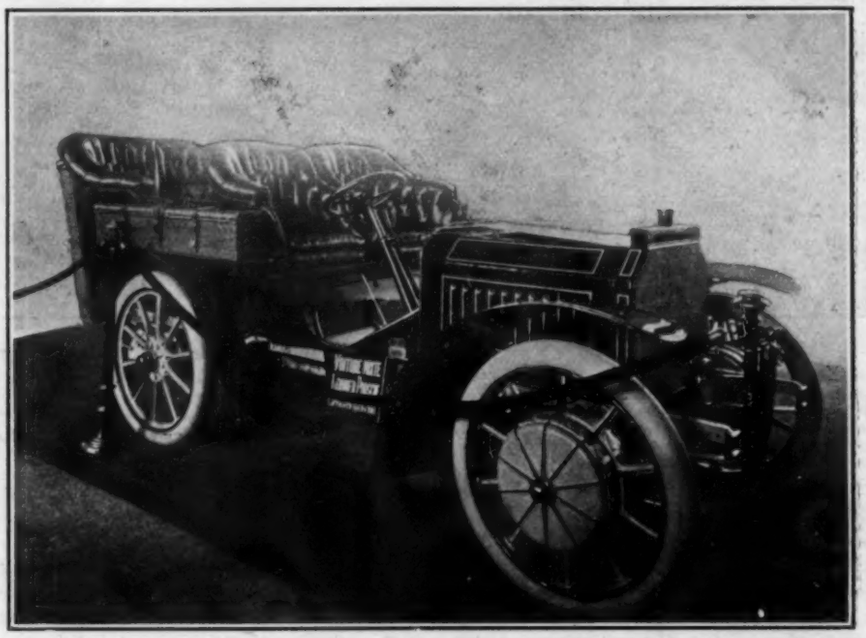

NEW STYLES OF BENZ MACHINES AT PARIS EXHIBITION.

The German firm Carl Benz of Mannheim, long known as the only manufacturers of old standing using belt transmission, remodeled the outward design of its cars to conform with modern usage in Europe and exhibited the new models first at the exhibition in Hamburg. These models are now shown at the Grand Palais. Until about 1897 or 1898 the Benz manufacture was represented in Paris by a branch factory and enjoyed considerable popularity until the Panhard-Levassor motor-in-front style of cars captured the popular fancy. Benz cars are used somewhat extensively in England.

The stand where the Roussel elastic wheel is exhibited is topped with a sign reading in colossal characters: "Suppression of Pneumatic Tires." This is what the automobile world is sighing for, and the end to which Mr. Maybach, of the Cannstatt-Daimler Company, has now bent his best efforts, according to one of the first reports received by cable from Paris. When King Leopold, of Belgium, inspected the new wheel, he said affably that it meant a revolution of automobilism. "Yes, sire, a peaceable revolution," answered the maker. The wheel gives more elasticity than pneumatic tires, but those who have ridden in vehicles equipped with these wheels assert that they do not recover quickly enough from jolts and produce the sensation that might be caused by riding over an oblong, rigid wheel and with very soft carriage springs. In other words, where the ground is not absolutely smooth, they cause a wavy motion of the carriage body.

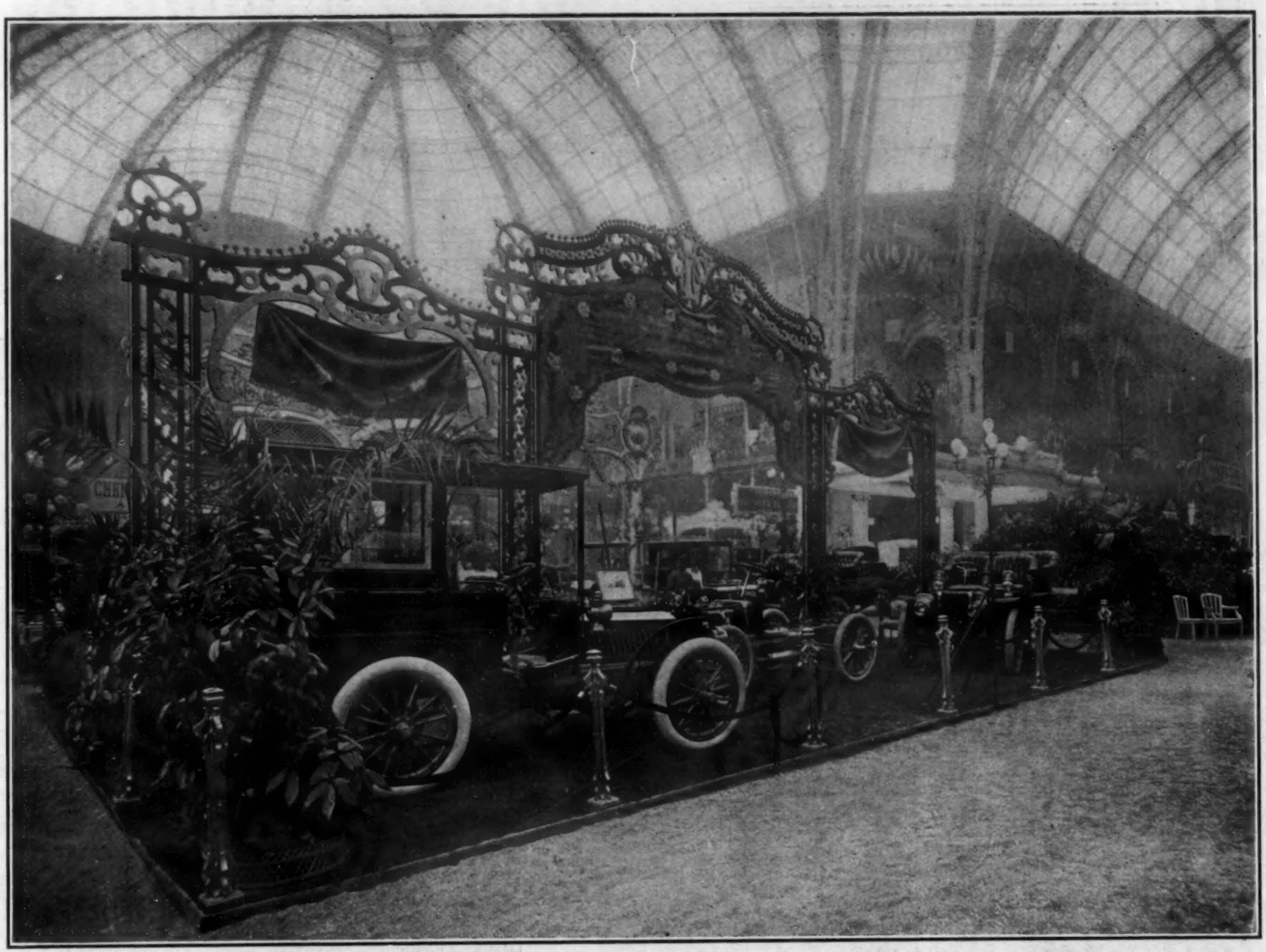
### A SPLIT AMONG ENGINEERS.

Two factions were rapidly forming during the first week of the Show among those who had decided opinions on that most elusive construction question relating to the regulation of gasoline motors by the throttle. One faction comprised the advocates of mechanically operated admission valves who almost without exception vary the quantity of gas mixture admitted to the cylinders according to the power desired. These believe in constant composition of the gas, that is, an unvarying proportion between hydro-carbon vapor and atmospheric air, and, on the other hand, varying compression of the charge. These two things necessarily go together and are hard to manage with automatic valve lift. The other faction believes in automatically operated admission valves, unvarying compression and varying composition of the mixture, and insists strongly that varying compression is a fallacy incompatible with accurate regulation of the power. The latter school has at least the advantage that it may adopt mechanically actuated valves without departing from its system of fuel regulation, while their opponents cannot go back to the automatic valve without abandoning its fuel feed system also. In the end the question resolves itself, it seems, into one relating to the refinement of carbureters. If the refinement indicated in the Krebs carbureter, described in last week's issue of this publication, proves practicable and equal to the accuracy of air feed required with the varying-compression system, the first mentioned faction should win out, if for no other reason then because the system of unvarying composition of the mixture gives greater assurance of proper ignition of the charge at all degrees of throttling and is therefore likely to render a wider range of power development possible, which means that it will produce a more flexible power than the older method. But it does undoubtedly call for most accurate workmanship in cylinders, valves and gas-feeding mechanism. From present indications highly interesting modifications of both systems may be expected during 1903, as there is a middle ground between the two which has not yet been rationally cultivated.



PANHARD ET LEVASSOR "MIXED" CAR, BUILT UNDER LOHNER-PORSCHE PATENTS.

This vehicle is front-driven and front steered. The gasoline motor and cooling apparatus is on the Mercedes model. The power transmission is by dynamo, auxiliary storage battery and electric motors in the front wheels.



DE DIETRICH MACHINES AT THE SALON—A STAND MUCH ADMIRED BY THE FASHIONABLE SET AND MEMBERS OF THE FRENCH GOVERNMENT AND THE ARMY.

The De Dietrich Company of Luneville has always been closely identified with the use of automobiles in the French colonies in Africa and for military purposes. It was the first company to manufacture luxurious touring cars of high seating capacity. The omnibus in the foreground is an improved type of the similar large vehicle which won honors in the heavyweight (Poids lourds) trials from Paris to Nice and return.

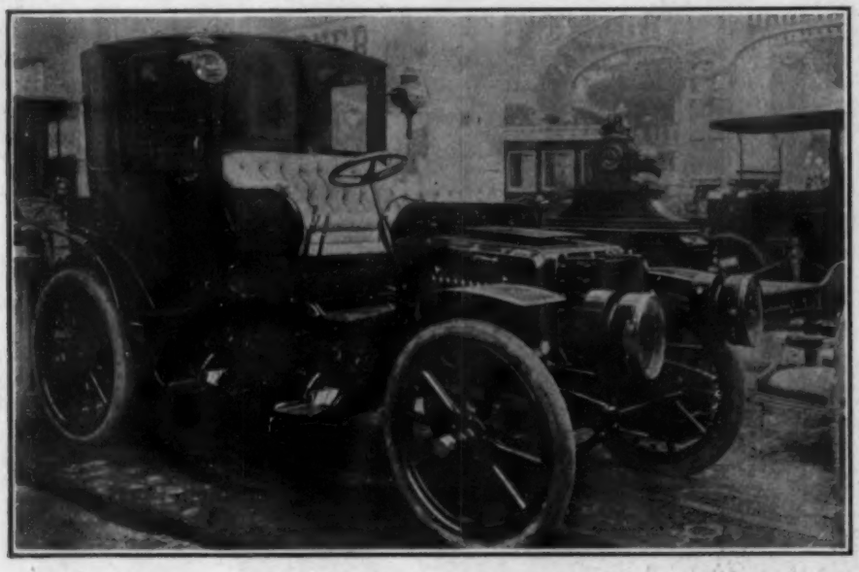
# TREND OF PARIS SHOW TOWARD SIMPLE DESIGN.

## MOTORS GET MOST ATTENTION.

**French Industry Now Satisfied to Adopt Good Construction Wherever Originated—Great Stress Laid on Improved Fuel Feed at Slow Speed —Features of Two Panhard Machines.**

PARIS, Dec. 15.—The keynote of the Paris Automobile Exposition is the tendency among French makers to follow up everything that has proven a success in the leading types of cars, and from being originators they have settled down to the imitation of anything that experience has shown them to be best in automobile construction. During the past few years they have been eliminating constructive features which were either defective or not altogether satisfactory, and if a mechanical device is not suitable and fails to fit in the general scheme of an automobile, as if it were an integral and necessary part, it cannot have the slightest chance of success.

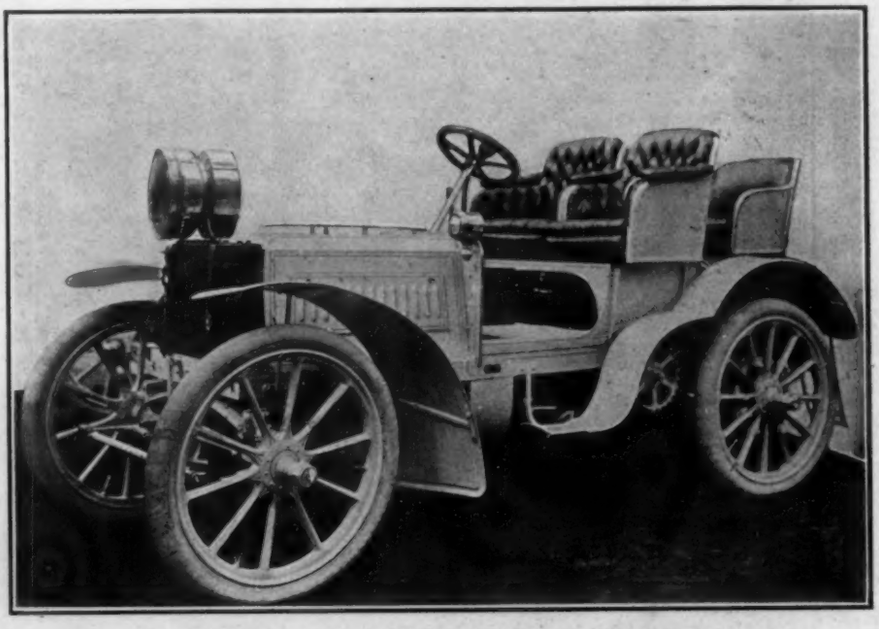
In no class of mechanism is homogeneity required so much as in the motor vehicle. The propelling machinery must be considered as a whole, and the more there is of it the greater is the risk of its developing some weakness which will go to spoil the efficiency of the car. Makers are therefore aiming at simplicity and strength, and having narrowed down the lines on which the vehicle is developing they find themselves grappling, for the moment at any rate, with a limited number of problems that are being more or less successfully worked out in the carriages exhibited at the show.



PANHARD ET LEVASSOR COUPE FOR CITY AND COUNTRY.

### NOT POSSIBLE ONE YEAR AGO.

On the whole an inspection of the cars shows that this tendency is favorable to the progress of the automobile up to a certain point. It is clear that makers cannot reach perfection by working in a narrow groove, though by dint of patient attention to detail they may succeed in improving the cars to such an extent that perfection may seem to be within easy reach. The new types of cars have certainly got to this stage, and the vehicles now being turned out for the 1903 trade have got to a point of elasticity of engine power and quietness of running that would scarcely have been deemed possible a year ago. Still, this does not represent the whole of the progress that is possible in automobile construction, and it is for this reason that makers should not be deterred from designing new systems of propelling mechanism. Many such systems are to be seen at the Show, some of them of a highly ingenious and interesting character. No doubt many of them are destined to drop into oblivion on account of their being a little too ingenious and complicated, as others have done in the past, but it is only by experimenting with every possible form of power transmission that we may hope to see the development of a perfect type of automobile, one that will be not only silent and easy of control, but, what is more to the point, absolutely reliable, economical in upkeep and of cheap construction.



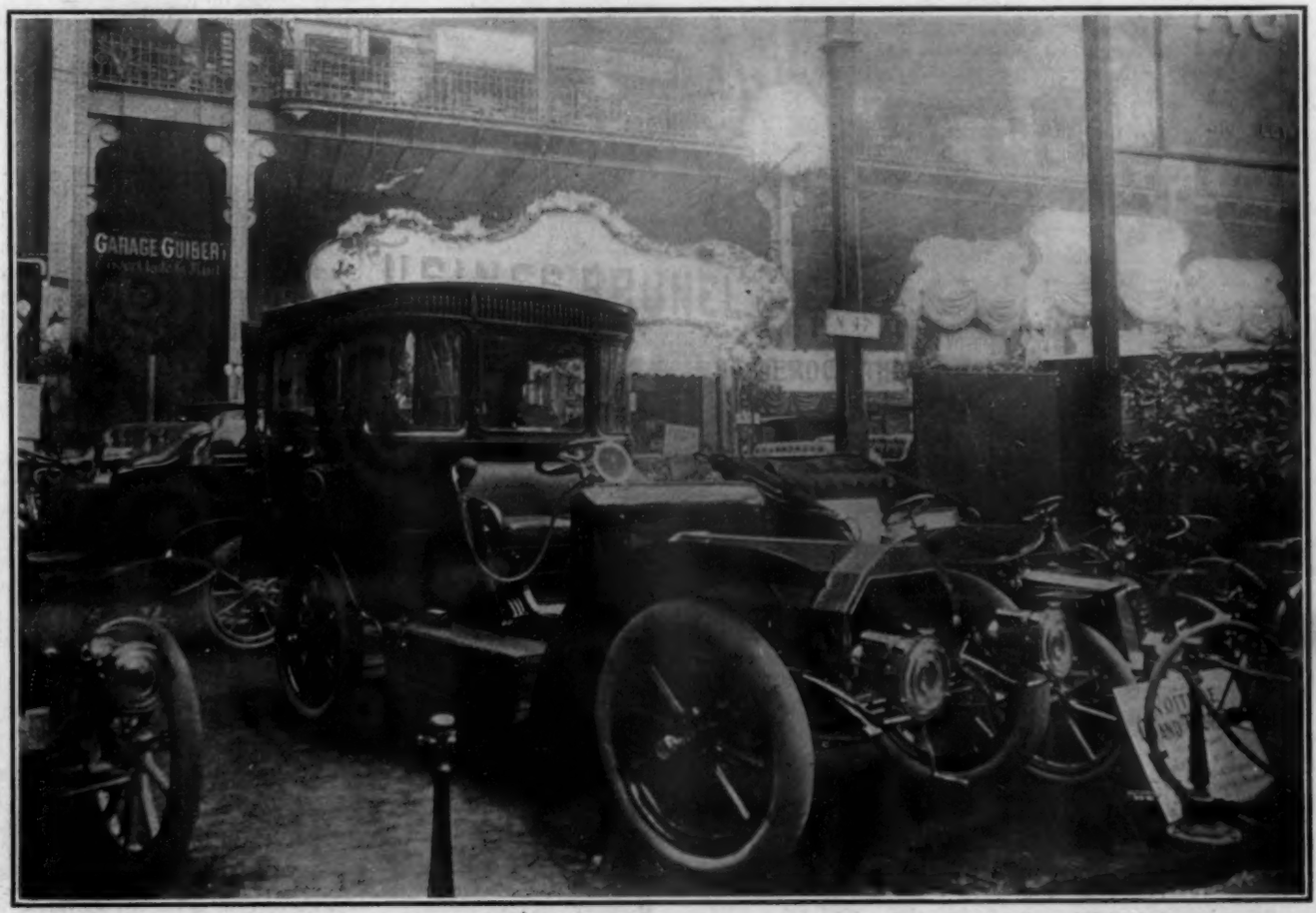
8-HORSEPOWER THREE SEAT PANHARD ET LEVASSOR CAR.

For the moment makers have reduced their transmissions to the simplest form possible. The improvements being carried out in these are mere matters of detail, and manufacturers are centering their attention chiefly on the motors, in which there is undoubtedly much more to be done than in any other part of the carriage mechanism. Until quite recently the French gasoline cars have been rather objectionable on the score of noise, for the Frenchman preferred the noise to the back pressure of an efficient muffler. As the public now insist upon having silent cars, manufacturers have been obliged to supply the need by modifying the design of their engines, chiefly in the way of building them with mechanical inlet valves.

### POSITIVE FUEL FEED.

With the automatic valve the difficulty is in opening the valve and getting a full charge with a reduced piston speed, but long before the motor drops to this speed the motor draws in a much smaller quantity of gasoline, and unless the air admission is accurately adjusted the cylinder is being filled with poor gas just at the

moment when it requires a more powerful explosion. This of course is less noticeable in the small motors than in the big engines where the valves are large and heavy. Thus there are two difficulties with the automatic valve which can only be overcome by operating the induction valves mechanically and employing more suitable types of carbureters. From what we have seen of recent developments the carbureter is of more importance even than the mechanical valve and may even in time render it unnecessary. With the mechanical valve the engines can be slowed down to 200 revolutions a minute, and the noise is so far suppressed that the latest types of automobiles are as silent as the electric car.




**OMNIBUS OF THE COMPAGNIE PARISIENNE—PRONOUNCED THE ACME OF COMFORT FOR CONTINENTAL TOURING.**

**This vehicle, among others, exemplifies the thorough confidence of the French industry in the extensive use of automobiles for luxurious forms of traveling in which the element of sport is entirely subordinated to comfort.**

### TYPICAL CARS IN TWO SIZES.

The position of the industry as a whole may be illustrated through the description of a typical car embodying features which are the most prominent in recent practice. Panhard et Levassor exhibit two underframes, one of 60 horse power and the other of 8 horse power. In their frames they have not followed the example of other leading firms who employ steel frames, and they still adhere to their armored wood system of construction, but a feature is the doing away with the secondary frame which formerly carried the engine, this being now fixed direct to the main members. The four cylinders are bored out of steel and have cast heads and thin copper jackets. The valves are on each side of the cylinders and are operated by half time shafts driven from the engine shaft. A special form of cam is employed so that the inlet valves can be held up when starting the big engine, which can be done as easily as with the smallest motor.

The engine is carried by two steel rods passing through lugs on the crank chamber and fastened to the side members of the frame by brackets. There is, in fact, a tendency to suppress rigid connections altogether, so as to prevent any flexion of the frame from putting strains on the motor and gearing. The ignition is by rupture spark and the accumulators are kept charged by a small dynamo driven from the flywheel. On the flywheel there is a ventilator which induces a current of air around the crank chamber and sends it on to the tubular water tank in front. This tank is another feature which has been adopted and improved upon by French makers, and it is fitted to most of the cars in the Show. It is known as the honeycomb type on account of the tank being pierced with a multitude of air cells of rectangular form, but in others, as in the Mors and Darracq, the cells are elongated and offer very thin walls to the air. Usually the fan is placed directly behind the tank, but this merely has the effect of cooling the outer portions of the honeycomb, and in the new Panhard and certain other makes the ventilator is set right back on the flywheel. The change speed gear is unchanged, and most firms who have tried other systems are returning to the original Panhard type, usually modified to give direct drive on the top speed.

The 8 horse power car has a three cylinder motor with the cranks set at 120 degrees. This type has been adopted to secure a better balance of the engine and give to the small motor the same smoothness of running as the four cylinder engine. It has automatic induction valves, and the constructional features of the frame are the same as in the older cars. Everything has been simplified in the mechanism. An entirely new feature is the suppression of the levers for throttling the motor and advancing and retarding

ignition. This is replaced by a couple of small ebony hand wheels on the steering wheel. These are on the ends of copper tubes in three sections, the outer sections fitting in the toothed edges of the central one. To actuate this device one or the other of the tubes is drawn away from the central ring and, on being turned for throttling or altering the ignition, is loosened, when it springs back and is held in position by the toothed edges. The engine is thus entirely controlled without taking the hands from the steering wheel.

TO MAINTAIN PROPORTION OF MIXTURE.

Another novelty in the Panhard car is the new carbureter which seems destined to do a great deal in the way of increasing the efficiency of gasoline motors. As explained, the adjustment of the air to the gasoline cannot be done properly by hand, and the Panhard people have therefore devised a carbureter in which the proportion is maintained automatically. [A description and illustration of this carbureter were given last week, p. 17.—Ed.] It consists practically in the adaptation of an extra air inlet to the Mercedes type of carbureter. The usual air inlet has an aperture large enough to admit just sufficient quantity of air for a proper mixture when the motor is running at its lowest speed. The second air inlet is closed by a piston which is connected by a rod with a larger piston in a short tube. This piston is of much smaller diameter than the tube and they are connected by an elastic diaphragm, and as there is an opening in the cap of the tube, the piston and membrane are always under atmospheric pressure. The lower piston opens and closes the extra air ports. When therefore the engine is running at its normal speed the suction of the motor draws down the piston and uncovers the ports, so that air is admitted in proportion to the larger amount of gasoline sucked through the spray nipple. As the suctional strokes weaken, the piston only partly uncovers the ports, and finally, when the motor runs slow, the suctional effort is not sufficient to overcome the resistance of the spring which holds up the piston. The ports therefore remain closed, and air is only drawn through the small inlet, so that the proportion of air and gas remains the same and the explosions are the same at whatever rate the motor may be running. There are two or three other carbureters in the Show on much the same principle, and they all point to very important developments in the designing of carbureters.

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William K. Vanderbilt, Jr., has, according to *L'Auto Velo*, cabled an order for a Mors racing machine, and requested the makers to enter him in the Paris-Madrid international race for next summer.

# Public Events in the New Year.

## Advancement of the Automobile Industry in America Requires Organization of Sport Under National Rules.

BY W. P. STEPHENS.

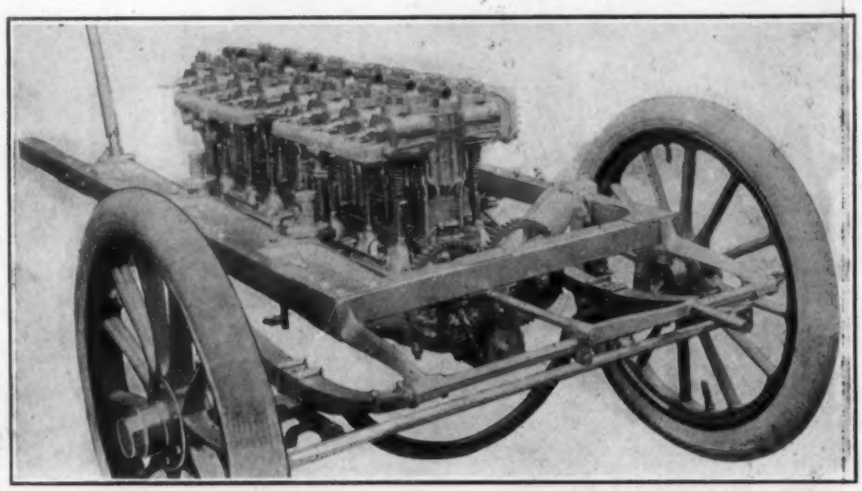
With the change of date of the great annual New York Show from November to January comes a corresponding change of the motorist's calendar by which it is harmonized with that of every day life. In previous years the November Show, with its fascinating display of new types and styles, has marked rather the premature beginning of a new season than the ending of the old; this year the late termination of the Reliability Run and the absence of the Show have left the motoring season of 1902 to die a natural death with the old year. With the New Year comes first the news of the great Paris Show, then the first of the American shows, that in New York, and shortly after the second show in Chicago. Following these is an inviting prospect of sport on road and track and above all of the active participation of America in the great international event of the year.

The year now ending will be remembered as a period of successful growth and steady, even progress. There is a much larger number of really good vehicles, with a general improvement of the standard of design and construction, as compared with the conditions one year ago.

Led by the Automobile Club of America, the work of the clubs has extended with their number, and the American clubs to-day constitute a factor that must be considered whenever questions of the improvement and the proper use of the roads are up for public discussion and legislative action. The continued growth of the club movement is adding strength not only to motoring, but to the many interests in the line of highway improvement which are necessarily associated with it. Within the year this movement has been further strengthened by the organization of a national union of clubs, the Automobile Association of America, with the specific object of centering and consolidating efforts that might otherwise be divergent or even antagonistic. But much remains to be done before the working organization of this body can be considered complete and adapted for its purpose.

During the year the daily press and the public at large have come to recognize the benefits of those public events which unite all classes of motorists on a common ground of social intercourse and technical advancement, such as the shows, the endurance runs and the speed contests. Apart from all direct influence within the ranks of motorists, these affairs are indispensable at a time when active efforts must still necessarily follow educational lines.

Without attempting to anticipate the surprises of the coming Show, it is safe to say that its increased size, as indicated by the heavy demands for space and the utilization of every available square foot of the Garden, will be no more notable than the all-around improvement in the cars, both steam and gasoline. It is not too much to expect that this Show, with



EIGHT CYLINDER MOTOR DESIGNED BY MR. GIRARDOT.

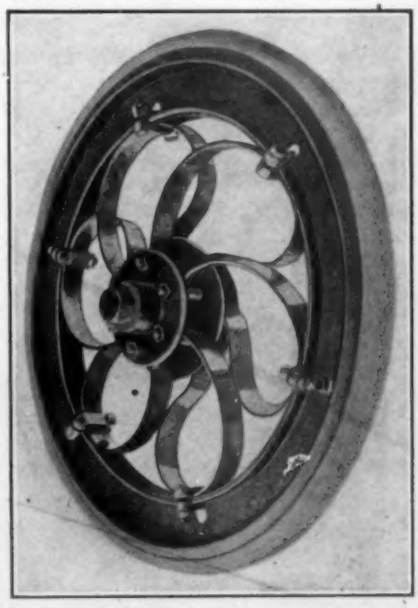
This 40-horsepower motor has not been tried in practice, but is designed to propel a heavy vehicle on the high gear exclusively, though one low gear is to be fitted also, but exclusively for starting. By having eight cylinders it is the idea to make it possible to operate the motor at very low speed by virtue of the "constant torque" or regularity of power impulse. A flywheel is fitted as usual, however.

the one in Chicago four weeks later, will exhibit the American motor car industry in an entirely new light, revealing in perfected form much that was only suggested in the shows of 1901-2.

While no formal announcements of outdoor events have yet been made, it is certain that the list will greatly exceed that of the past year. The new Reliability Run of the A. C. A. will be over at least as great a distance as that of 1902 and under much more stringent conditions; in addition, the club will for the first time hold a road test of commercial vehicles. The demand for this class, in all sizes from the light delivery wagon to the heaviest lorry, is growing faster at the present time than the efforts of inventors and manufacturers to meet it; and when the right vehicles are placed on sale as freely as pleasure cars now are there will be work for all makers. A well managed road contest will do much to awaken all parties to the importance of this line of work and to prove to those who are most interested—the present users of horse-drawn wagons and trucks—the practicability of the new vehicles as a class and the specific merits of certain makes.

The popularity of the one-day endurance run with makers and owners, and the opportunity thus afforded to display the motor car to good advantage before the public, make it probable that this class of road contest will be continued by the leading clubs.

From present indications the international race for the Bennett cup, which will probably be held in Ireland or France, will be watched as keenly by Americans as by other nations, as it is assured that at least one and perhaps three American drivers will compete. The competition thus far in all great international races has been confined to France, Germany and Great Britain, but international racing in every branch of sport is a habit, almost a disease with Americans, and this year they will appear in earnest in the new sport. In motor car racing, as in yachting and canoeing, much more is required than mere personal skill and prowess, as the contest involves the design and construction of the vehicle as well as its successful manipulation. It is hardly to be doubted that the American, though newer in the game than his foreign competitors, will ultimately excel them in the design and construction of a motor car just as he has long done in similar work in both canoeing and yachting, and that to the advantage thus gained he will add a daring and intelligence in the handling which will make success a certainty.



THE ROUSSEL ELASTIC WHEEL.

GARDNER-SERPOLLET STEAM CARRIAGE BUILT FOR THE SHAH OF PERSIA.

Few thoughtful motorists will deny that racing is but a means and not an end, and that the development of speed has already reached an extreme, while progress in more important lines is comparatively backward. At the same time it is to speeding above all other and more useful branches of motoring that we must look to keep alive that public interest which is most undeniably a factor in the advancement of the motor car in general use. When it comes to the question of practical utility—the vital one after all is said—it is difficult to conceive of any possible use on an open trackless highway of vehicles traveling at speeds of fifty to eighty miles per hour; nor can the perfection of such vehicles have other than a remote and indirect effect upon the development of cars for use within legal limits. At the same time there is no denying that speed is an attraction to the inventor and maker, the driver, the motoring public, and, almost above all, to the general public. For the immediate present and for an indefinite time to come there is a wide field of utility for motor car racing if a viewpoint more practical than exalted is taken.

If racing is to be carried on successfully it must be managed as carefully and systematically as a business enterprise. There is no such thing as playing with a sport; if it is to be carried on to the satisfaction of all parties and to the realization of the greatest possible advantage, it must be treated seriously, with carefully made rules enforced to the letter. The toleration of imperfect rules and loose practices merely because pleasure and recreation are the sole ends in view will ultimately ruin any sport. Motor car racing has thus for been conducted in this country under rules that are incomplete and defective in themselves and that in many cases are none too rigidly enforced; the results being seen in the failure of many attempted races. While valid reasons may have existed for such a state of affairs at the outset, when racing like all else connected with motoring was experimental, there can no longer be any excuse for a further toleration of such conditions. It is desirable that the work of revising the racing rules be taken up at once, as it must inevitably involve more or less delay and it should be completed and the result published before the racing season begins. There are many points in connection with racing rules and conditions on which opinions may honestly differ, but there is one that should need no argument and that is the rejection, at the outset, of all forms of handicap racing. As so long applied to other sports, notably to yachting and horse-racing, handicapping is at best but a lame makeshift; the conditions of horse-racing to a certain extent make it possible and desirable, but in yachting, which is closely allied to motor car racing, it is a relic of the past that has long since ceased to offer any reason for its

continuance. There is no reason to believe that, considering the innumerable difficulties encountered in yacht sailing, and launch and steam yacht racing alike, any satisfactory handicap will ever be devised for a motor car; and even if such were possible from a purely sporting standpoint, it would be of no technical value. With so many important and interesting problems before the designer and driver, it is a waste of time to experiment with methods of handicapping.

There is one question which may well take precedence of all others in the discussion of racing conditions, and that is the classes of cars which shall be recognized on the race courses. Thus far there has been no attempt whatever to discriminate between the service car in racing condition and the extreme racing machine, and both have been admitted to the tracks together. It is an obvious truth, backed up by long experience in other sports, that a continuance of this condition can result in but one way: the disappearance of the service car.

The great difficulty in the way of motor car racing to-day, in this country as abroad, is the legal limitations to slow speeds on the roads backed by both public and official opinion. In England the general law stands as an immovable bar to road racing, as in the State of New York and other parts of this country. In European countries where the authorities are endowed with the power to suspend the law for special events, great difficulty is experienced in obtaining such authorization; and after every great race such as Paris-Berlin and Paris-Vienna the question arises as to whether another will be permitted. The superiority of the long-distance straight-away road race over all contests on closed tracks is beyond dispute; the limitations on speed imposed by the best of existing tracks are too well known to all drivers of speed cars. While at the present time it is largely a question of track racing or no racing at all, the interests of the sport demand an extension of road racing in this country. No single effort, however powerful, can accomplish this end; success can only come through a deliberate and systematic campaign on the part of the clubs and individual motorists for the molding of public opinion with a resultant effect upon legislative and executive powers.

It should be possible for such a responsible organization as the American Automobile Association or the Automobile Club of America to secure an official authorization at least once in a year for the use of the public roads for a speed contest, such as the Gordon Bennett cup race, under such precautions as will ensure a reasonable safety from accidents to the public. Such contests, especially if of an international character as they would soon become, would excite keen interest on the part of the general public. As a stimulus to American designers, manufacturers and drivers they would far exceed every form of motor sport now possible.


**AMONG THE CARS LOOKED UPON IN PARIS AS THOROUGHLY UP-TO-DATE AND CLEVER IN CONSTRUCTION**

Details the Delahaye holds high rank. The high-powered car to the left shows the Mercedes hood with the radiator as made in Paris by Arquembourg. The smaller car to the right shows the older type which is much prettier. Baudry de Saunier in "La Locomotion" calls the Mercedes pattern the "coffin hood" (capot de cercueil) and contends that it is much too lugubrious in appearance to hold the foremost place on a gay automobile in gay France.

## CLEVELAND POST-OFFICE USES AUTOS IN HOLIDAY RUSH.

*Special Correspondence.*

CLEVELAND, Dec. 27.—During the holiday rush here the postoffice authorities were compelled to adopt some additional means of delivering the mails, as the carriers could not handle it all. They therefore resorted to the automobile, and, although the snow was deep part of the time, they found no trouble in covering dispatch. For the most part runabouts, great distances and doing the work with with a box attached to the rear, were used, and they proved a success. The Oldsmobile was conspicuous, as the company took pains to prepare an outfit for the purpose. A nice box, finished in the same color as the body of the machine, and about 2 x 2 x 4 feet in size, was attached to the rear of the seat. On it in gold letters was painted "U. S. Mail, Oldsmobile Line." There has been some talk here of using automobile wagons for transferring mail to and from trains and collecting from boxes over the city. The success attending this trial in the dead of winter will probably give an impetus to the authorities in deciding on the use of the machines for this purpose.

President A. L. Prescott, of the Prescott Automobile Co., New York, returned recently from a European trip and reports increasing popularity of American steam vehicles in Great Britain.

# MOTOR BOATS

## POWERFUL GASOLINE BOAT FOR MISSIONARY USE.

NEW HAVEN, Dec. 27.—One of the most interesting departures in the motor boat line in Connecticut is the gasoline craft *Glad Tidings*, which is being built at Noank by W. C. Smith for Capt. Charles T. Potter, an ex-city missionary of Norwich. This boat is to be put into missionary work at the Lesser Antilles, where she will encounter the roughest of weather and where there are few harbors, and consequently her requirements are far different from what is looked for in the every day gasoline boat. She will be rushed ahead rapidly and sent out to the care of the Rev. Frederick Dunne, a missionary at St. Kitts. This is the first time, as far as known, that the gasoline motor has been put into misisonary work.

The *Glad Tidings* will be forty feet long, about nine feet beam, and very heavily built. She is of a "chunky" shape, being of seaworthy rather than of fancy model. Heavy timbers and planking will be necessary as she will have to be hauled up on the beaches down there in the hurricane season, as there are few harbors. Strong tackle will be taken out with her for the purpose of hauling her out of the water at such times. She will also have large ringbolts at both stem and stern to permit of her being hoisted upon a ship's deck.

She will have a freeboard at the waist of nearly four feet, and her bow and rounding full stern will be correspondingly high. So it will be seen that she will be high out of water. A snug cabin with beds and fittings for the missionaries will be placed well in the bow, while aft of this will be a shallow cockpit so high above the level of the sea that if the boat ships a wave sufficient to bury her it will soon leave her free and clear again, because the sloping deck will shed most of the water, and large scupper holes leading overboard from the cockpit will allow the rest to run off quickly.

She will be heavily powdered with Lathrop motors from Mystic, and will have a low rig of canvas, two leg-o'-mutton sails and a jib, to be used in a free wind. This sail and the fact that she is non-sinkable will make her a safe craft even if her engines become disabled.

The *Glad Tidings* will also carry heavy chains and anchors, as she will have to lie outside all of the time. She is to be used at St. Kitts, Nevis, Montserrat, Antigua, Barbadoes, St. Martain and the Saba Islands. She will be sent out on the deck of a steamer from New York this winter, and extra parts of machinery and carpenter's and machinist's tools will go with her for use upon her in those out of the way places. She will be finished in 60 days.


A CORNER OF THE CHARRON, GIRARDOT ET VOIGT STAND, WHERE IS EXHIBITED A WAR AUTOMOBILE

Equipped with a Hotchkiss Mitrailleuse capable of firing 600 shots per minute. The operator of the gun sits in a bullet-proof inclosure taking the place of the tonneau.

Messrs. Barnes and Burrows, of New London, after fitting out an auxiliary sloop for a trip through the canals and bays to Florida, have given up the idea of the voyage and the sloop has been loaded upon a light lumber schooner for transportation south. Promises of rough weather caused the voyage to be abandoned.

# Expert Discussion of the Oil-Engine Automobiles of 1902*—V.

BY CAPT. C. C. LONGRIDGE.

## VALVE ACTION AND CHARGE CONTROL.

Governing is so intimately connected with valve action, charge formation, and ignition, that it may well be considered next. For the purposes of governing, the old "hit-and-miss," or total cut-out arrangement, has practically disappeared. In its place, four systems are in use.

By far the larger number of car motors use a charge volume throttle, Fig. 1, usually a valve fixed on the induction pipe, but occasionally, as in the Bollée and Duryea cars, in the form of an inlet valve with variable lift. The throttle, worked by hand, or by the governor, or by both, reduces the volume of the charge admitted and thus slows down the motor. The author has no hesitation in condemning this system as theoretically bad. Incomplete filling of the cylinder reduces the compression, and thus renders the conditions for efficient and economical explosion less favorable. Again, the induction of the charge below atmospheric pressure entails negative work.[1] Thirdly, where jet carburation is used the mixture is varied.

The second system, less general, is the exhaust throttle. The opening of the exhaust valve is retarded, a certain proportion of exhaust gas remains in the cylinder, the inlet valve opens later, and less fresh charge is admitted. In this case, there is a certain amount of back pressure, and the mixture is diluted with exhaust gases; but the cylinder being fully filled, the compression is preserved, and there is sufficient evidence to show that from this factor alone greater economy results. The marked economy of the Gillet-Forest motor is attributed to this method of governing. An illustration of the application of the principle is the De Dion Patent, No. 22762 of 1900, Fig. 2. Where this method of governing is adopted, correctness of mixture would appear very necessary. For, assuming Mr. Grover's experiments with coal gas, as applicable to hydrocarbons, the mean pressure is influenced not by the products of combustion present, within the workable limits, but by the correct ratio of air to gas, which alone determines the possibility of an explosion and the pressure generated.

A third system, in very general use, usually in combination with one of the preceding methods, is by retarding the charge ignition. The effect of delayed ignition is to give the piston time to expand the charge, thus reducing the force of the explosion and the duration of its action on the piston. In other words, the full power value of the oil is not obtained. The method is, therefore, wasteful, and unless automatically coupled with the throttle valve, may, in the hands of a careless driver, lead to premature explosion.

The author inclines to think that the second, or perhaps a fourth, method would be the best, namely, governing by retaining the full charge of air, and reducing the amount of petrol. The methods of carburation in the De Dion, Darracq, and Holyoke cars, already mentioned, are on these lines. It might be thought that governing on this plan could not be extended over more than a fifty per cent. variation of speed, the "critical point" of the mixture being then reached. With the ordinary methods of carburation this would probably be the case. But by carburating at or near the end of the compression stroke, it is likely that a far wider range might be covered. The difficulty of ignition could be met by setting the ignition plug in the course of the incoming fuel, thus insuring locally a mixture sufficiently rich for inflammation. A provision of this kind is described, among others, in Patent No. 3971, 1893, of Messrs. Hartley and Kerr. Supercompression, for the same purpose, is described in Patent No. 13,325, L. A. Letourbe, who condemns volume throttling on account of its thermal inefficiency.

### CHARGE EXPANSION.

Having carried the subject as far as the ignition of the charge, there remain a few other points on which it may be wise to add a word or two before describing the application of the motor power to the car itself.

The first of these points is expansion during the working stroke. As a direct object of design, no Otto cycle petrol-car motor on the market provides for increased expansion during the working stroke; indirectly, as a result of governing by throttling, greater expansion, under the action of the throttling, is obtained. The disadvantages of this method have already been noticed; loss of fuel value by reduced compression, negative work in suction below atmosphere pressure; and, if gain by increased expansion were in view, reduced power by the diminished weight of charge. Though it is doubtful whether in Otto cycle car-motors any attempt at further utilization of the exhaust pressure would be successful, efforts in this direction are worth consideration. To overcome the disadvantages enumerated above, some inventors admitted a full charge to the cylinder, subsequently expelling a portion, thus giving greater expansion to the rest. Two variations may be noticed.

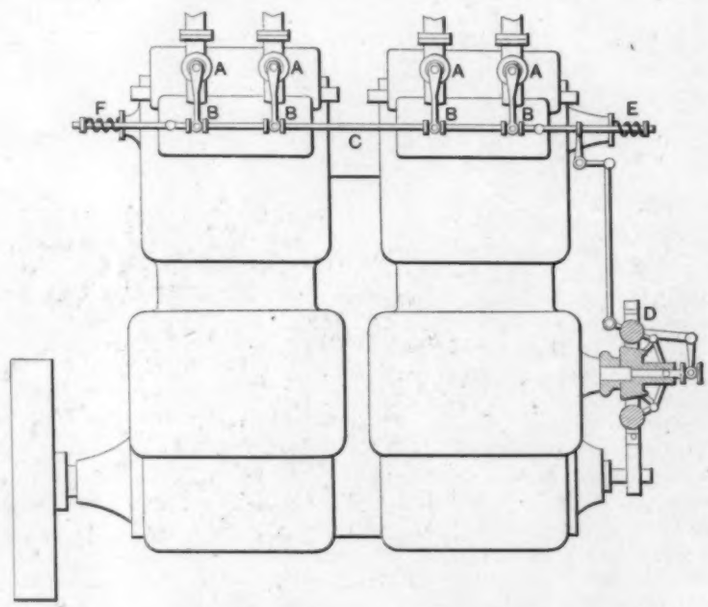



FIG. 1—SYSTEM OF VOLUME THROTTLING (MORS).

A A, throttle valves on induction pipes. B B, valve levers. C, valve shaft, opening under action of governor D. Of the two springs E and F, the former is the stronger and tends to open the valves.

In their patent, No. 8469 of 1891, the Gas Motoren Fabrik Deutz draw in a full charge of air only during the suction stroke, a portion of this is expelled on the compression stroke, while at the same time gas or hydrocarbon vapor is added to the rest. The French inventors, Forest and Gallice, Patent No. 22,559 of the same year, varied this procedure. Taking advantage of the fact that in a four-cylinder motor, one piston is charging while another is compressing, they reduce the charge by transferring part of the contents of the compressing cylinder to the charging cylinder. Both these methods eliminate nega-

*From a paper read before the Institution of Mechanical Engineers in London, England.

[1]Often 7 or 8 per cent. of the indicated horse power.

tive work in charging; but, like volume throttling, they adversely affect efficiency and power.

Another method of procuring increased expansion by diminished charge is illustrated in motors governing on the exhaust.

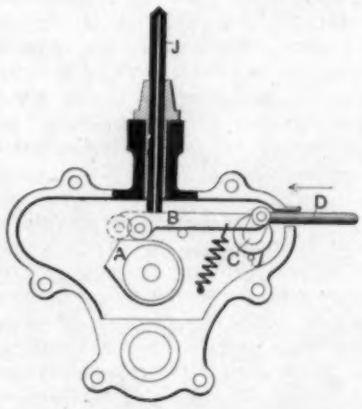



Fig. 2—DE DION AND BOUTON EXHAUST GOVERNOR.

A, cam acting, through lever B, on exhaust valve stem tappet J. B, lever, pivoted to crank C, and movable from right to left by rod D. Any movement of the lever to the left decreases the lift of the valve, as may seen from the dotted or maximum postion of the lever, at which position the exhaust valve remains closed.

To reduce the fresh charge more or less of the exhaust is retained in the cylinder. It is intelligible that the practice should be economical; for, though back pressure is created and the charge diluted, suction below atmospheric pressure is avoided, and, which is the maint point, compression is preserved. The Gas Motoren Fabrik Deutz, in its patent No. 2729, 1892, ingeniously eliminates all back pressure by giving a free-exhaust stroke, drawing back part of the exhaust during a portion of the suction stroke, then closing the exhaust valve and opening the charge inlet valve for the remainder of the stroke. Taken broadly, as a principle, increased expansion by charge reduction might, perhaps, be useful in designing motors liable to temporary demands for power in excess of their normal yield, as, for instance, in hill climbing. In such case, the cylinder would be so dimensioned that a full charge would provide very high compression and increased power for use on occasions when a temporary increase of vibration, etc., would be of no consequence. For normal running, the reduced charge and lower compression would be employed.[2] Against the advantage of this reserve power would be the slightly increased dimensions and weight of cylinders, etc. On the other hand, provision of reserve power is, with single-acting Otto engines, the only way to reduce change speed gears to a minimum—a step much to be desired.

[2]This principal is adopted by the Franklin Manufacturing Co., Syracuse, New York. In normal work, the motor is throttled down much below its maximum capacity. The full power is used only for the severest hills or the highest speeds.

Other inventors have worked in quite a different direction, seeking greater expansion by increase of the working stroke. By lengthening the sweep of the piston during the working stroke additional expansion is obtained. Such mechanical contrivances as the Atkinson linkage, though undoubtedly economical, are too cumbersome for car work.

USING ADDITIONAL CYLINDERS.

Other inventors again have aimed at increased expansion by additional cylinders. Excluding the system of compounding[3] which is not likely to be introduced in light motor-cars, adaptations of the above principle have found, and others may find, a possible application to motor-car work. Engines of the Burt so-called compound, but more strictly expansive Otto type, are too heavy and complicated for this class of work. A clever method initiated, perhaps, by the Atkinson engine and adopted in such motors as the Koch, Gebrüder-Brille Hyler-White, Pietot, etc., is the use of two pistons in one cylinder (in this sense two cylinders). The plan gives rapid and good expansion, but is attended with some obvious disadvantages, which, however, have not prevented it from finding favor with many automobilists. Another ingenious way of increasing expansion is illustrated in the "Scott" vertical high-speed engine of Messrs. Reavell & Co. The bottom end of the cylinder is closed and is therefore equivalent to a second cylinder. There is no compounding, but increased expansion is got by the alternate use of the top and bottom ends of the same cylinder. At the termination of the down or power stroke, steam is transferred to the underside of the piston, working expansively on the upstroke, during the latter half of which the residual steam in the top cylinder is compressed in the clearance space. Fresh steam

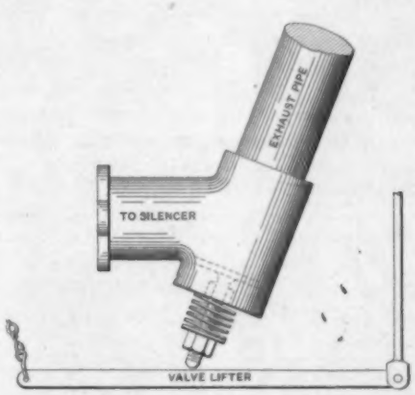



Fig. 3—EXHAUST RELEASE VALVE (BROOKE).

is then admitted and the cycle repeated. The method gives increased expansion, very perfect cushioning and freedom from drop on the release of the high pressure or top cylinder. Some such arrangement might be applicable to the Otto cycle.

[3]With separate high- and low-pressure cylinders.

CYLINDER COOLING.

This is the second point on which something has to be said. For any but the smallest motors, air-cooling, except as a supplementary aid, is impracticable, or in any case, vastly inferior to water-cooling.

This latter system may be sub-divided into forced and natural. Of these, the former, by far the more general, is affected by pump, usually of the centrifugal type; the latter, by placing the water tank higher than the cylinders, circulation following the difference of temperature. The security of this system is its only strong point. In other respects it is inferior to forced circulation. Not only to maintain a given cylinder-temperature does the slower circulation require a larger body of water to be carried; but the very cause of the circulation is defective. In the jacket water rises upwards round the cylinder, because it becomes hotter. It is thus placed in a condition to exert the least cooling effect, where it is most wanted, round the combustion chamber and valves. The result is an increase in the natural tendency to unequal cylinder expansion, which adversely affects the casting, the piston rings, and general running of the engine.

Possibly the best method of all, and certainly the safest, would be a combination of the two systems. Where pump circulation alone is employed, it is advisable to provide against overheating due to breakdowns. The safeguard, usually supplied, is a float glass on the dashboard, in which the position of the float indicates the maintenance of the circulation. But this requires the driver's attention, a demand to be avoided. A very ingenious French method, communicated to the writer by Dugald Clerk, for indicating the piston water circulation in gas engines, is to lead the discharge into a tank, fitted with a ball cock, connected with the gas valve. If the circulation fails the tank water-level falls, the ball cock sinks, cutting off the gas and stopping the engine before damage is done. On somewhat similar lines, the author recently suggested fitting on the pump discharge pipe a lift valve, so connected with the electric ignition or the petrol supply that, as long as the cooling water circulated, the valve and its connection remained in their normal position; but, if the pump failed, the fall of the valve back to its seat broke the electric current or the petrol supply and so brought the motor to a standstill. A mercurial tube in connection with the cylinder jackets offers another method of interrupting the firing, when, owing to a pump failure, the cylinder temperature becomes dangerously high.

An ingenious method of avoiding air or water cooling is described in Patents Nos. 24,091 and 24,311, J. T. Dawes. Inside the cylinder is a layer of non-conducting material, then a thin metal liner. The trunk piston, closed at the end, works outside the cylinder, a forked connecting rod

being used. The inside of the cylinder is thus kept very hot, while the outside is sufficiently cool for running.

The question of what is the proper cylinder temperature is one that admits of two answers, according to the standpoint taken, namely, that of efficiency or that of power. A very considerable heat loss arises from the cooling of the explosion gases by contact with the cylinder walls and piston. Hence the higher the temperature of these latter, the lower their cooling effect. High cylinder temperature, therefore, conduces to efficiency, considered as the ratio of heat converted into work to the total heat imparted to the engine. Under this aspect then the cylinder walls should be kept as hot as they can be efficiently run. But, when power is considered, different considerations intervene. Other conditions being alike, the more charge that can be included by a cylinder of given dimensions, the more power will be produced by the explosion. Thus power depends on the weight of the charge. Now one charge, having half the absolute temperature of another, will have double its weight, and its explosion will generate proportionately greater power. Low temperature, therefore, by diminishing the heat of the incoming charge, favors increased body and therefore increased power.

In connection with this subject, Professor Hele-Shaw presented to the late International Engineering Congress at Glasgow a summary of power tests confirmatory of the above. His series of experiments showed that in a motor with jacket water ranging from 77 degrees Fahr. to 250 degrees Fahr. there was, with increase of the water temperature, a gradual decrease of horse power declining from 4.775 brake horse power to 3.94 brake horse power. A determination of the engine speed and quantity of water circulated was omitted, but the figures are still interesting as an illustration of the effect of cylinder temperature on power. In 1896, Mr. James Atkinson stated that for every 5 1-2 degrees Fahr. by which the charge in the cylinder was reduced in temperature before compression one per cent. more power could be obtained from the engine. Low cylinder temperature results in easier lubrication, and, therefore, likely enough, in reduced friction, a possible factor in the increase of power.

As coolers, various types of radiators are used, with or without auxiliary fans, these being useful adjuncts in hot climates or for long hill climbs. In patent No. 8471, P. Royer uses the mudguards as tubular radiators. Cylinder cooling by water injection has already been noticed.

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Arrangements have been made for the use of four motor buses to transport the race-going public of Cincinnati from the Newport car barns to the race track there, which has been opened as a winter race course.

# CLUBLAND

## CLUB AND GARAGE ARRANGEMENT OF MUTUAL ADVANTAGE.

*Special Correspondence.*

BRIDGEPORT, CONN., Dec. 27.—The Automobile Club of Bridgeport expects to open its new club room in Brandegee's Park City Automobile station on January 5 with a smoker and a talk by A. L. Riker. President C. C. Godfrey and Treasurer J. B. Cornwall have been entrusted with the task of selecting a suitable equipment for the club room. Nothing luxurious or extravagant will be provided, the idea being to give the members a serviceable lounging room with a desk, long table and comfortable chairs where automobile subjects may be discussed and literature of the sport be read. It will also make a convenient meeting place and when there is an extra large attendance the folding doors of Mr. Brandegee's office can be thrown open and a large double room provided.

The club room idea has been fostered by certain members in the face of some opposition. Some members contended when the club was first organized that a club room was unnecessary and never would be needed, as all that was wanted was a place to store machines. They contended that the regular monthly meetings of the club could be held at one of the social clubs, or at some of the business offices of various members which were freely offered. This was done for awhile, but it was believed that this year with a club membership of nearly sixty permanent headquarters should be furnished.

When the club book was issued in the fall of 1900 this paragraph was printed on the last page: "Note—One important aim of this club is to establish in the near future an automibile station where the machines of members can be kept and cared for at a nominal cost. It is expected that such a station fully equipped and in charge of a competent engineer will be provided in the center of the city. Members will be able to have their automibiles ready for them at short notice, this arrangement adding greatly to the pleasure and convenience of owning and operating a motor vehicle. In connection with this 'auto stable' will be provided a lounging room and library for the use of members."

The club is already installed at the automobile station erected by W. S. Brandegee at 625 State Street, after being burned out last summer at J. N. Bulkely's automobile station on Cannon Street.

The new establishment was built solely for an automobile station. It is the most complete of its kind, it is believed, in New England. It was erected by Mr. Brandegee with the express understanding that the Automobile Club of Bridgeport should make its headquarters there and give the station its patronage. It is a one story brick building with sufficient asphalted floor space to accommodate seventy-five machines. One corner is partitioned off for the Automobile Repair Co., which does all the repairing. At the other end is the engine room and electric light plant. At this end also there is a second story which provides the club room and Mr. Brandegee's office. These rooms are large and comfortable and floored and ceiled in hard wood. It will be difficult to find another city of less than a 100,000 population with such adequate and up-to-date quarters for its automobilists.

### Philadelphia Club's New Home.

The Automobile Club of Philadelphia has in less than two years grown to a point where a new club house became a necessity, and it has recently installed itself in very comfortable headquarters at 1404 South Penn Square, a central location facing the south front of the City Hall. On December 19 a reception was held, President Henry G. Morris, vice-President John S. Mucké and Secretary-Treasurer Frank C. Lewin doing the honors. The house is handsomely furnished, and when fully equipped will afford every accommodation for both members and machines.

The club is exerting its influence for the restraint of excessive speed and reckless driving, and at the same time is working for the extention of motoring.

### State Meeting in New York.

SYRACUSE, Dec. 29.—The local automobile club has adopted a tasty button as its emblem. It is of solid gold with dark blue enamel. In gold letters are the words "Automobile Club of Syracuse," surrounding a winged wheel.

It is expected that the banquet of the club on January 5 will be an elaborate affair. The mayor and several dignitaries have accepted invitations to be present.

Secretary F. H. Elliott of the club has received a letter from Oliver A. Quayle, of the Albany Automobile Club, asking the date of the preliminary meeting for the formation of the proposed State Association of Automobile Clubs. Mr. Elliott says that he will call it soon after the banquet and that the meeting will be adjourned to the New York automobile show for permanent organization.

### California Club Election.

SAN FRANCISCO, Dec. 23.—The result of the fourth annual election of the Automobile Club of California, for the year 1903, is as follows:

President, F. A. Hyde [re-elected]; vice-president, E. Courtney Ford; secretary, E. P. Brinegar; treasurer, Byron Jackson [re-elected]. Board of governors—C. C. Moore, A. M. Hunt, C. A. Hawkins, A. E. Brooke Ridley [all re-elected], and Dr. D. A. Stapler.

# Numbering Ordinance in Chicago.

The motorists of Chicago are up in arms over a proposed ordinance which, if passed, will compel them to carry an official number on the face of each lamp and also a number with eight-inch figures on the rear of the machine, so illuminated as to be visible by night. This ordinance was introduced by Alderman Finn on December 8 and passed unanimously, being favored by Alderman Honore Palmer, a member of the Chicago Automobile Club. It was, however, vetoed by Mayor Harrison on the ground that the matter concerned park boards as well as the city at large, and such legislation should be concurred in by the park authorities.

Many motorists are bitterly opposed to the numbering of cars, and some have proposed that monograms or small initials be substituted, but some members of the club favor the numbering ordinance provided the figures are not more than four inches in height and the list of numbers is not made public. The matter is still pending, but it is probable that the ordinance will be introduced again, with some modifications. The following letter and photographs relate to the matter:

Editor THE AUTOMOBILE:

Sir:—The accompanying photographs illustrate two methods of marking automobiles which may interest your readers. The one with large figures on the rear shows about how the business would be accomplished by some of the Chicago city fathers, and the other is a substitute suggested by the undersigned.

The ordinance now under consideration here proposes an eight-inch figure on the rear of the machine, which, when carved out of wood and silvered, on a black-ground, is about as comforting to the owner of an automobile as a tin can must be to a dog's tail.

Had the author of this proposal added a few more inches or a foot to his requirements, the people would have understood it to have been a jest and they would have let it go at that; but the sense of proportion is like the age of discretion in that it comes late to some people and to others not at all; so that a few dollars expended in demonstrating the absurdity of such a measure was thought to be a good educational investment.

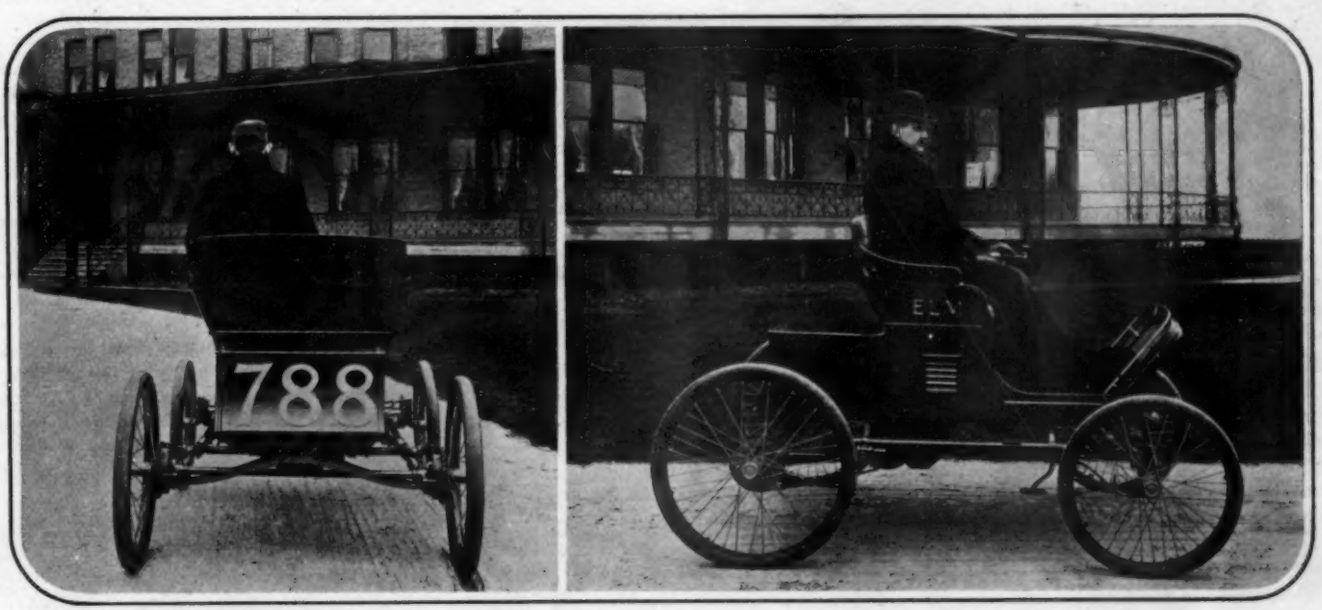
The idea of marking the rear of an automobile seems narrow, in that it provides only for the apprehension of scorchers who have gone by. If the marking was upon the ends of the seat (where cabs and carriages are supposed to show their numbers), the chances would be in favor of an earlier detection and more in harmony with the views of the law-abiding automobilists, who are overwhelmingly in the majority.

The second photograph shows the same machine marked with the initials of the owner in two-and-one-half-inch (2 1-2 in.) nickeled letters, and is offered as an outside limit of size—not the best by any means, but as a compromise between the best and the worst.

The public should remember that there was the same trouble years ago from reckless driving of cabs that is now being experienced from reckless automobile drivers, and they should not overdo the police department's end of detecting criminals by branding all hands with an offensive signboard. Let the criminals be put in stripes and have their hair cut, but do not disfigure an artistic piece of mechanism that is going to be so conspicuous on the streets of all large cities just because an occasional scoundrel injures some one accidently and hasn't the manhood to stand for the consequences.

E. L. MOORE.

*Chicago, Ill.*




HOW THE COUNCIL WOULD HAVE MACHINES NUMBERED. PLAN SUGGESTED BY AN AUTOMOBILIST.

## INSPECTION AND LICENSE LAW IN PHILADELPHIA.

*Special Correspondence.*

PHILADELPHIA, Dec. 29.—Mayor Ashbridge on Friday last put his name to the ordinance which recently passed Councils, making eight miles an hour the maximum limit for automobiles. In the busiest sections of the municipality seven miles an hour is the limit, while in the district bounded by Vine, South and Sixteenth streets and the Delaware River it is prohibited to approach a curve or a street intersection at a greater rate of speed than five miles an hour.

The ordinance does not apply to trolley cars or locomotives, which meander through populous sections of the city at a twenty-five-mile crawl. All automobiles must hereafter be approved and certified as safe in licenses to be issued by the Department of Public Safety, after inspection by the Bureau of Boiler Inspection.

Any operator who drives his machine in the streets without a license may now be dragged from his vehicle and haled before the nearest magistrate. The punishment for infraction of the law is graded to fit the crime, from $10 for the first violation to indefinite suspension of license for the fourth offense. The manufacturer who fails to comply with the terms of the new ordinance does so at the cost of $50 for the first dereliction, the amount being increased proportionately with each additional breach.

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SATURDAY, JANUARY 3, 1903.

*With New Year greetings to its readers "The Automobile and Motor Review" this week opens a new volume under an abbreviated title. The change in name will probably be welcomed by all. When "The Automobile" and the "Motor Review" were consolidated last June, it was thought best to incorporate both names in the title until the identity of the publication should have been thoroughly established. This, we believe, has now been done.*

## IMPORTANCE OF THE CHÂSSIS.

Material for thought and suggestions for action have been furnished the automobile world lately in great profusion. So rapidly have new facts been revealed, indeed, and new impressions created, that our mental digestion suffers under the strain and refuses to extract all the nourishment that is offered.

Only two or three weeks ago the Automobile Club of America presented its elaborate report of the 500 Mile Reliability Contest, in which lies buried some information not available by mere surface reading or perfunctory classification of its contents. As a memento of the most important event in the history of American automobilism in the past year this report is entitled to an analysis that will bring out all it contains of general interest, but the publication of such an analysis has so far been crowded out of these pages by the pressure of news matter from at home and abroad.

New and interesting models of automobiles, intended to be exhibited at the impending display in the Madison Square Garden in New York, have been produced by our manufacturers in unprecedented number and embody features in construction and design which clamor for descriptive mention, even while it remains impossible—through the physical limitations of man in time and space—to obtain and convey that accurate information which can be expressed only in mechanical drawings. Our manufacturers, as a rule, prefer to leave these revelations to be made at the annual shows, fearful, no doubt, that others might steal their thunder. And yet the broad public is getting more and more interested in exact information and less and less inclined to accept generalities, from which no definite mental conception of the distinctive features of each machine may be formed.

A wave of legislative effort has swept over this country resulting for the greater part in immature and makeshift restrictions upon automobile traffic which fail to protect anybody while constituting a serious annoyance to automobilists, a hindrance to natural development and a threat to the industry. How this unpropitious tendency shall be counteracted by those who believe in a free field for the automobile movement, but who also respect the will of the majority, is a question engrossing in its importance, and for which the answer must be found soon.

Concurrently with the popular disposition to check the good with the bad—setting fire to the house to secure the culprits—another movement is on foot to enlarge the sphere of motor vehicles by the extensive construction of improved highways. Highly laudable though this movement is on general principles, it reminds one somewhat of the tail wagging the dog when championed too exclusively by users of automobiles, the building of roads presenting a financial and economical problem of the greatest magnitude overshadowing the financial benefits so far obtained through the substitution of mechanical traction for horse power. Broad co-operation and common cause with all elements in society which are interested in the improvement of roads seems the indispensable requirement for a telling success in those efforts for transforming this into a good-roads country which have now reached our national legislature in the form of the Brownlow bill. As a measure specially designed for the relief of automobilists and specially defended by them as a class, this comprehensive proposition for the extension of good roads evidently has small chance for favorable consideration. It needs support from other classes, even if it be lukewarm and grudgingly granted, more than additional enthusiasm from owners of touring cars.

In both movements referred to—the local disposition to fetter automobilism and the already nationalized demand for better roads—there is plainly disclosed an immediate necessity for bringing the automobile industry into more intimate relations with the work, economy and enterprises of the people at large than it has so far sustained. Only so will its bearers be enabled to swing those large issues, which are becoming involved in its progress, into channels of success.

If the "national license" agitation, fathered by the National Association of Automobile Manufacturers, were backed by public opinion, it, too, would here enter for consideration.

"Drive carefully and not too fast, obey the laws and be considerate of the rights and feelings of others," is the advice, excellent so far as it goes, by following which, we are told, the antagonists of automobilism should be placated and brought around to support our demands. But being of the nature of a moral precept, this good advice must await the general betterment of human nature, before it will be followed. The mere conciliation of opponents will also hardly dispose them to give us more than just what we are entitled to as members of the body politic. But if, on the other hand, they are drawn into the automobile net and are made to see that motor vehicles of one kind or another are intended for them and for their business, and that hardships imposed upon the movement are liable to be their hardships, then they become partisans at once, and the demands which cannot be legalized as a petition for special privilege to the few, becomes the will of the majority and therefore law, whether intrinsically well founded or otherwise.

For such results we must look to the manufacturers, because what is needed is evidently the extensive production of business automobiles, not only heavy trucks and drays and lighter delivery wagons of the type now common in the large cities, but a great variety of self-propelled vehicles adapted to the needs of many different occupations and nearly all classes of the population.

This development of business motor vehicles, which now appears so supremely important—not least for the owners of pleasure cars—has been greatly retarded in this country by the failing of our industry in developing a *châssis* of uniform type and adaptable to many different forms of vehicle body. The common use of large electric trucks dates from the day when a *châssis* was produced for this class of vehicles by the simple expedient of having the battery "underslung." Then each business man could see his way to arrange the superstructure according to his own special requirements.

In steam and gasoline machines the motive power has very generally been built into the carriage body, and when the demand arose for a steam or gasoline business vehicle, the manufacturer was not ready to say to his would-be customer: "Here is a *châssis*, a frame and running gear. Nothing projects above this frame. Do with it what you like. Any wagon maker can fill your order."

Whatever a manufacturer may consider the best design for a pleasure car, it seems that it would be greatly for his own benefit and for that of the whole automobile movement, if he would also develop an independent frame for business vehicles, upon which men in all walks of life could try their art to make it serve the multifarious business requirements with which automobile manufacturers, as such, cannot possibly be conversant.

No other step would seem to be so well calculated to advance the day when the entire population will consider the progress of the automobile industry bound up with its own welfare.

As if we had not enough to ponder upon in the momentous issues already referred to, the Paris exposition adds its quota of suggestions. Among all the interesting details and chit-chat from this great display one central fact looms up with special significance. All the progress noted there, or nearly all, has for its purpose to improve the operation of automobiles *at slow speed*, and to extend the usefulness of automobiles into new spheres. To be sure, speed has not been sacrificed. Far from it; it remains a commercial requirement. But the best talent of constructors has been devoted to the problem of rendering the gasoline motor efficient and powerful below 200 revolutions of the motor shaft. Comfort, usefulness and adaptation to a variety of purposes—mostly in the luxury class, however—are the supreme considerations in the French industry to-day, and the next step must logically be toward the extension of mechanical traction to the everyday work of the people.

If we must take the keynote to improvements from France, we could take none better than this.

### Cleveland and the Cup Race.

CLEVELAND, Dec. 27.—Clevelanders say that if the Gordon-Bennett trophy is won by the American team, it will go to a Clevelander, for they believe the team will be made up almost entirely of contestants driving Cleveland machines. The Winton, the White and the Peerless will all be entered, if accepted by the Automobile Club of America, and it is believed they will be. Alexander Winton will drive his own machine; Rollin White will drive the White and L. P. Mooers will drive the Peerless. if they are entered in the race.

Exports of automobiles and parts from the port of New York for the week ended December 27 are reported as follows: British West Indies, three packages, $124; Dutch East Indies, one package, $740; Genoa, one package, $100; Havre, one package, $437; London, ten packages, $5,000; San Domingo, two packages, $30; Southampton, five packages, $933; Turin, three packages, $1,500; U. S. Colombia, one package, $75.

## AMERICAN CARS AND IDEAS FOR ENGLISH SALESROOMS.

### TRADESMEN SEEKING THEM HERE

**Factories in Ohio and Michigan Visited and Some Orders Placed—Gasoline Touring Cars and Steam Vehicles Wanted—Interchangeability of Parts Liked but English Finish Preferred.**

*Special Correspondence.*

CLEVELAND, Dec. 27.—It seems that Englishmen are determined to have American machines for next season, as a number of them have been visiting the various factories in this section of the country during the past few weeks and will, doubtless, place orders for a large number of vehicles before they go back. They are not only looking for machines, but for pointers in conducting business as well. It is altogether possible that the English market will take on the appearance of the American stores, if they follow up the ideas they are securing in this country.

A few days ago L. Williams, of England, visited the factory of the Sandusky Automobile Co. and then went to Toledo and Detroit to look over other machines and plants. Mr. Williams expressed himself as well satisfied with what he has found in the American market. While all American machines will not suit Englishmen, there are many which will meet the requirements, especially if they are shipped in a stripped condition and finished up in that country and equipped according to the taste of the English people. A heavier machine is used in England than in America, although the roads are better. They do not seem to care much for an imitation of the American buggy or carriage, but want a motor car in the true sense of the word. For this reason, most of the machines that American manufacturers will send to England will be of the touring car type.

It is claimed by Englishmen that their machines have a better finish than the American product and also that the steel and some other materials are superior to ours, but at the same time they say they have found machines here which are fully up to anything they have in their country. They admit, too, that Americans can produce machines cheaper than English manufacturers, owing to the superior workmanship of the men and the system of making parts and then assembling them afterward. Another advantage is that the Americans make all the parts so that they may be carried in stock, and it takes only a very short time to make repairs or replace a broken part. There is no delay and the convenience to dealers is almost inestimable.

The gasoline machines which Englishmen will purchase in this country will be largely operated with kerosene in that country, on account of the high price of gasoline. Improvements have been devised that will enable them to do this with the oil they use, it is claimed.

Mr. Williams says that he will take back with him at least three machines and that he will leave an order for probably thirty or forty more. He expects to establish a business in American machines in that country, because their general superiority over the other machines for sale there.

W. A. Cloud, of Cloud & Nichols, boiler, yacht and launch builders and general engineers, Chiswick, London, W., is another Englishman who has been visiting manufacturers in this section and was in Cleveland a few days ago. His purpose is to select a gasoline machine that will meet the requirements of the English users. He has closed a contract with the Geneva Automobile Mfg. Co., Geneva, for a number of steam machines, after having given that machine a thorough trial, but for the others he has not yet made arrangements. Mr. Cloud is an experienced engineer, knows just what can be handled in his country and will make an exhaustive search before he settles upon anything in the gasoline line.

### Reduced Rates to Chicago Show.

The Western Passenger Association and the Trunk Line Association have joined the Central Passenger Association in granting the rate of one fare and one-third for the return trip to the Good Roads Convention of the National Association of Automobile Manufacturers to be held at the Coliseum during the Chicago show, February 14 to 21. The Western Passenger Association covers all the territory west of Illinois as far west as Cheyenne, Wyo., and including all points in Colorado. The Trunk Line Association includes all of the principal eastern roads, so that the only points from which a rate has not yet been granted are the New England States and the Pacific coast.

### Philadelphia Show in March.

An exhibition of motor vehicles similar to that of last year will be held in Philadelphia during the week of March 2 to March 7. The location will be Horticultural Hall. A reception will be held every evening and the clubs of other cities will be invited to attend. It is hoped that the Automobile Club of America may be induced to make a club run to Philadelphia during the show. Information as to space and arrangements may be had of H. D. Le Cato, 712 Girard Building.

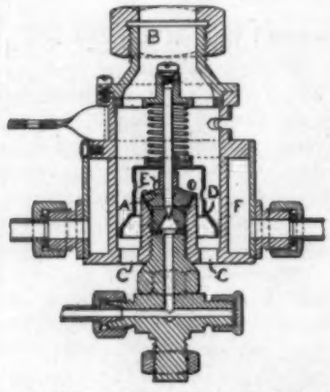
Late additions to the list of exhibitors at the Chicago show are the Motsinger Device Mfg. Co., Fournier-Searchmont Automobile Co., Wagner Cycle Co., Crompton Motor Vehicle Co., Pope-Robinson Co., Speedwell Automobile Co., J. B. McCanna Co. and Fisher Automobile Co.

# Patents

### Longuemare Carbureter.

No. 715,398—A. A. Longuemare, of Paris, France.

The object of this invention is to dispense with the constant level cup and float feed commonly used, by drawing the gasoline directly from the tank under natural or artificial pressure. The gasoline enters at A, and passes upward, meeting first an orifice closed by a needle valve to be referred to later. On passing this needle valve it divides through radial passages to several spraying orifices formed, as in other carbureters of the Longuemare type, by cutting grooves in the conical seat of a screw plug A. The stem of the needle valve works freely up and down in this plug, and its upper end is guided by a bearing in a cross arm, in which is a screw acting as a stop to limit the motion of the needle valve. Attached to the stem is a light metal bell, whose




LONGUEMARE CARBURETER.

lower end is expanded to nearly the inner diameter of the mixing chamber, and whose walls are perforated at different heights. Connection is made at B with a pipe leading to the cylinder, and the fresh air enters by the holes C C. The rush of air lifts the bell D, thereby opening the needle valve and permitting gasoline to be sucked up to mingle with the air. The gasoline spray and air pass out through the perforations in the bell, and the mixture is diluted as required by air admitted through holes E of adjustable opening. A portion of the exhaust gases is allowed to pass through the annular space F around the mixing chamber to supply the heat absorbed by the gasoline in vaporizing. The spring G is made stiff enough to close the needle valve promptly against the inertia of the bell, and also to resist the pressure of the gasoline on the needle valve.

Although the specifications do not say so, it is evident that to whatever extent the pressure on the gasoline assists to make it flow through the spraying orifices, the amount of gasoline thus flowing will vary with the pressure; so that, although this device dispenses with the need of a float chamber for the mere purpose of keeping gasoline from flowing continuously from the spraying orifices, it will not insure a uniform feed unless the pressure is uniform.

### Three Point Running Gear.

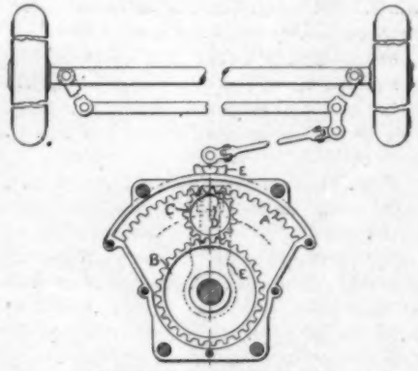
No. 710,063. Hermann Lemp, Lynn, Mass., assignor to Elihu Thomson.

According to the inventor of this running gear, the ideal method of flexibly tying the axles in parallelism with each other is by two pairs of reaches triangularly disposed, each pair forming a triangle with one of the axles and being swiveled at their junction to the center of the other axle. As this is impractical for constructional reasons, the inventor uses one pair of reaches, *AA*, forming a triangle with the front axle and swiveled to the rear axle *B*. In lieu of the second pair, he mounts the body on three springs, two elliptical side springs *CC* and one transverse front spring *D*, the points of support of the body forming a triangle oppositely disposed to that formed by the reaches and the front axle. Instead of elliptical rear springs, any other springs may be used which give two points of support and do not permit lateral motion of the body.

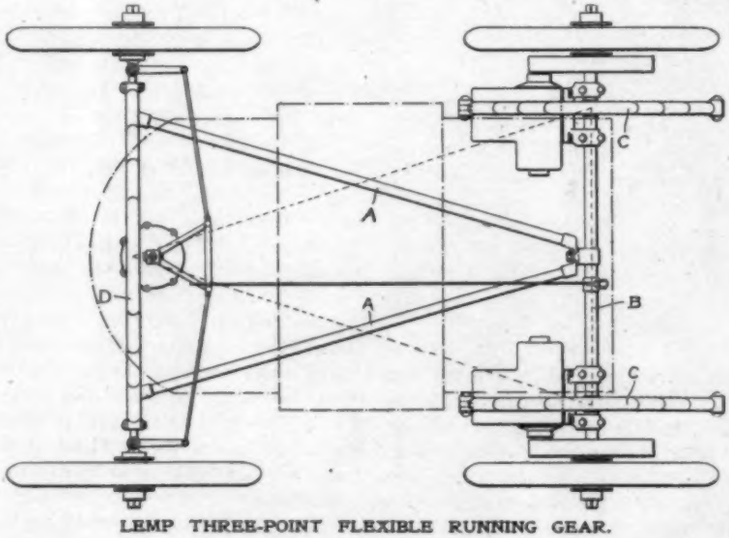
### Steering Gear for All Motor Vehicles

No. 715,302—H. A. Schryver and F. C. March, of Warren, Ohio.

The object of this invention is to provide a reducing gear for the steering mechanism which shall move the steering wheels more quickly, for a given arc of rotation of the steering column, when the steering wheels are near the angle of extreme lock than when they are nearly straight; the reason for this being found in the greater purchase and greater accuracy of control desirable at high speeds, when the wheels will be deflected through small angles only. In the mechanism by which these results are obtained, the internal toothed segment A is stationary, and the toothed wheel B is attached rigidly to the steering column, so that rotation of his wheel causes the toothed pinion C to roll along a path indicated by the dotted arc. From the lower face of this pinion projects an eccentric pin, indicated by the small dotted circle D. This pin, or a roller on the pin, works in a slot in the arm E, one end of which is swiveled concentrically with the base of the steering column, but is not attached thereto, and the other end of which is connected by suitable links to the steering knuckles. A study of this arrangement will show that when the wheels are in the straight ahead position, as drawn, if the eccentric pin D be (as is shown) located beyond the center of pinion C from the steering column, it acts with its miximum leverage on the arm E. Furthermore, the toothed wheel B exerts its maximum leverage on the pin. Both leverages are gained at the expense of rapidity of motion, and this is the result sought. On the other hand, when the pinion C is made to roll to one side or the other along A, pin D is brought nearer to the steering column, thus increasing the rapidity of motion of arm E while decreasing the leverage.




STEERING MECHANISM.




LEMP THREE-POINT FLEXIBLE RUNNING GEAR.

# STUDYING TO OVERCOME TIRE DIFFICULTIES.

## PROBLEMS FACED BY MAKERS.

**Akron Manufacturers Experimenting to Prevent Separation of Rubber and Fabric Under Brake Action—Higher Prices to Prevail Owing to Increased Cost of Raw Materials.**

*Special Correspondence.*

AKRON, OHIO, Dec. 27.—Tire manufacturers of Akron, who, it is said, produce 90 per cent. of all vehicle tires made in this country, are taking much interest in the automobile shows, and are planning for a largely increased demand for automobile tires for the coming season. Indeed, that demand is already being felt.

Experiments are being made with new tires and new compounds in tire making in all the local factories, especially by the B. F. Goodrich Co., the Diamond Rubber Co. and the Goodyear Tire and Rubber Co. Improvements in pneumatic and other tires for motor vehicles in the past two years have been very marked, but Akron manufacturers do not hesitate to predict that quite as important improvements will be made during the next twenty-four months. How these are to be brought about and just what the improvements will be no one knows, and those who have plans to accomplish these ends are far from ready to take the public into their confidence. One difficulty to be overcome is to prevent the separation of the fabric from the rubber in tires, and in other ways to resist the strain accompanying a sudden application of the brakes. In some quarters it is held that eventually pneumatic tires must give way to solid rubber on all the heavier automobiles. The claim is made that the pneumatic tires must be pumped up so hard on heavy machines that there is less resiliency than that afforded by the solid rubber. In the early days of pneumatic tires the suggestion that they could be used on machines weighing thousands of pounds would have been ridiculed.

UPWARD TENDENCY ON PRICES.

The increasing price of crude rubber will have a strong tendency to make all automobile tires dearer the coming year than during the twelvemonth just ending. Last spring crude gum of the best quality was bought by manufacturers at seventy cents a pound and thereabout, whereas for the same raw material at this time the price is from ten to twelve cents higher. Some large contracts were made by tire manufacturers when rubber was lower, and these must be filled. Not only on tires, but on all rubber goods a general strengthening of prices is being made. Rubber is not the only commodity necessary to the business which has advanced, and the upward movement of prices will hardly stop short of, even if it does not exceed, 10 per cent. There was a great demand the past season for lower prices on ordinary vehicle tires and for the solid automobile tires. This was met to some extent, but often, it is not denied, at the cost of quality. The situation became serious, and is still so considered, being made the worse, in fact, by the advance in the cost of crude rubber and other materials. The tendency among manufacturers, however, is to maintain both price and quality, upon the principle that low prices and cheap goods must in the end be unsatisfactory both to seller and buyer. This may mean a curtailment for a time of the amount of business done, but the best results will be achieved in the long run, the manufacturers say.

Manufacturers of automobile tires, and all rubber goods, for that matter, are much interested in the proposition before the French Chamber of Deputies to increase the duty on imported manufactured rubber from eight cents to twelve cents per pound. Although France is a large manufacturer of automobile and general vehicle tires, the "American invasion" has included American manufacturers of these lines, who look upon the proposed tariff as almost prohibitive.

# CLEVELAND MANUFACTURERS PREPARING FOR THE SHOWS.

*Special Correspondence.*

CLEVELAND, Dec. 27.—A number of leading automobile manufacturers and dealers held an impromptu banquet at the Hollenden Hotel a few evenings ago and discussed the subject of forming a local association of manufacturers and dealers. Among those present were Alexander Winton and Charles B. Shanks, of the Winton Motor Carriage Co.; L. H. Kittridge and L. P. Mooers, of the Peerless Co.; M. L. Goss, of the Baker Motor Vehicle Co.; George Collister and W. F. Sayle, of Collister & Sayle, and Colonel Pardee, of Chicago.

Local manufacturers are all devoting much attention to the work of completing and trying out their new models before giving them the finishing touches prior to shipment to the New York show. Cleveland will supply every type and style of machine, from the light runabout to the heaviest touring car and delivery wagon. Most of the manufacturers are going in for two-cylinder motors, although several of the lightest runabouts will be equipped with single-cylinder machines. In the touring cars there is a marked tendency toward French practice. The majority of the local manufacturers are placing their motors in front in a vertical position, and in most cases the hoods are square and higher and larger than heretofore. There is also a decided improvement in the size and comfort of the seats of tonneaus in particular. In several machines the tonneaus are fitted to carry four passengers without crowding, while two can ride in luxury.

No better evidence of the position of northern Ohio, and of Cleveland, in particular, in the automobile industry, could be found than the way in which this section will be represented at the show at Madison Square Garden. The list includes twelve Cleveland concerns and nine from other northern Ohio cities. Among these are thirteen complete vehicle makers and four tire manufacturers.

OLDSMOBILE COMPANY CHANGES.

The Oldsmobile Co., which has occupied the basement of the old Cleveland Athletic Clubhouse, has leased the first floor, at the same time retaining the basement, so that it now has about as much floor space as any of the new concerns which are building large especially designed establishments. With the two floors, there is space for fully 250 vehicles. The first floor has been handsomely fitted up as office and general salesroom. The storage room and repair shop are in the basement. The building is within a short distance of the residence portion of Euclid avenue and is at the same time convenient to the business district. The Oldsmobile Co. is now independent of the New York concern with which it was formerly affiliated and R. R. Owen, manager of the establishment, has bought up the outside interests and will incorporate under the name of the Oldsmobile Company of Ohio. The company has the exclusive control of Ohio and West Virginia and during 1902 disposed of more than 450 Olds machines in this territory. For 1903 a contract has been placed for 700 machines and already a number of these have been sold to agents as well as individuals.

### Will Move into New Plant.

*Special Correspondence.*

SYRACUSE, Dec. 29.—The H. H. Franklin Mfg. Co. will move at once into its new factory and purposes to have the plant in operation during the week of January 4. A large order for machinery has been placed and its installation will begin this week. The factory is of brick, four stories above the basement and 54 by 110 feet in dimensions. There is a power house, 30 by 40 feet in dimensions, a short distance from the main building. In this structure a complete electric power system will be installed by the Westinghouse Company. The greater part of the building will be devoted to the manufacture of automobiles. Castings will also be made, this part of the company's business having increased 100 per cent. during the past year.

The company has also had plans completed for two additional buildings. One will be 40 by 60 feet and will be located at the rear of the main factory. The other structure will be located at the left of the main building and will be used for an office.

# NEW VEHICLES

## The Winton Touring Car.

The new Winton touring car is built along the lines of the 1902 model, but a number of improvements have been made. Several months were spent in experimenting both in the changes in the machine proper and in securing a thoroughly satisfactory body. The machine has been given most rigorous tests on the roughest roads and steepest hills.

The motor is of the double-opposed, water-cooled standard Winton type, and will develop 20 horse power. The cylinders are cast from hard gray iron, and the top and bottom covers of the crank pit are cast aluminum, alloyed to combine lightness and strength. Much of this alloy, which is manufactured under a secret process, is used about the machine. The crank-case cover can be removed easily, but its construction is such as to prevent the leakage of oil or the admission of dust and dirt. The crank is forged in one piece from open-hearth steel, sufficiently heavy for any service, and the bearings are of phosphor bronze. The pistons are ground and the cylinders bored accurately, while the piston rings are cut before being turned to size, thus insuring even and perfect bearings. The air-pump connecting rod is secured to a lug cast solid with the forward motor piston. The connecting rods are drop-forged with phosphor-bronze bearings.

The transmission gear, made much the same as last year, is contained in an oil-tight and dust-proof case, all the steel gears operating against bronze. The gears are cut from drop-forged disks and the bronze bearings are accurately bored. The differential gear is of the spur type, operating in an oil-tight drum, packed with lubricant. As compared with the 1902 model, the driving chain represents a three-fold increase in strength and durability. The side rollers are made of cold rolled open-hearth steel and the pins of nickel steel. With this equipment, the manufacturers claim the machine will develop with its 20-horse power motor as great tractive power as the usual 25-horse power machine, the friction in transmission being reduced to a minimum through the peculiar combination of metals and the perfection of the mechanism.

The ignition system has been greatly simplified, all the delicate parts which have been a source of trouble being done away with. The circuit is protected from dampness and oil, and two sets of batteries are used, one being held in reserve. There is but one coil and no vibrator. The contacts on the circuit breaker are self-aligning and adjusting, and are so made as to free themselves of deposits of any kind. Their operation is visible under a heavy glass lid, which may be removed readily if required. To renew the contacts it is only necessary to insert a new plunger, which is the work of a minute.

The system of control consists of an air governor, which may be operated either by a button beneath the foot or a valve at the right of the seat. There are two levers, one controlling the hill-climbing and reverse gears, and the other the direct driving gear and emergency brake. With the direct driving gear lever drawn back, the operator can regulate his speed as he wishes with the spring button under his foot, and in case of emergency he can bring the machine to a sudden stop by throwing the lever forward from its central position, which applies a powerful brake. The hill-climbing and reverse gears operate in the usual way. This system of regulating speed is peculiar to the Winton. In addition to the emergency brake, which acts directly upon the motor, there are two others acting upon drums on the rear wheels which are cast solid with the hubs. They are controlled by a foot lever having a ratchet attachment to hold it when needed on a long incline.

The motor is lubricated from a reservoir beneath the bonnet, which connects with a float distributing chamber by a brass tube. This chamber is cast solid with the crank pit cover, and feed pipes convey the oil from it to the various bearings, the amount of oil being regulated by a packing in the chamber. The reservoir is placed high enough to insure a good pressure of oil in the chamber, and does away with the necessity of watching the machinery to keep it from heating. A centrifugal pump, driven by gear, with positive action, insures a rapid circulation through the cooling water system.

NEW 20 HORSE-POWER WINTON TOURING CAR.

The improvement in the steering gear consists of a heavier post than usual, made of extra heavy gauge 1 1-4-inch steel tubing, with strong support from the floor of the car, eight inches from the base, and steering wheel of heavy brass with a mahogany finished laminated wood rim. The gear is a development of the worm and segment principle, and the steering joints are of the ball and socket type, adjusting themselves to uneven road conditions. The frame is of double angle iron and sheet steel, with iron box corner connections and cross braces, all securely riveted. The front axle is forged from one solid piece of axle steel and the front wheels are equipped with double ball bearings. The rear axle is of the tubular tri-strut type, the live axle extending through from each rear wheel to the differential at the center, where it is secured by means of key and pin. It revolves in parallel anti-friction roller bearings, designed and made by the Winton people. Semi-elliptic springs are used at both front and rear. They are six inches longer than those used in the 1902 machine and are more elastic. The wheels are the special Winton artillery pattern.

All tanks are placed back of the radiating coil beneath the bonnet and are accessible by lifting the hood. The gasoline tank has a capacity of between eleven and twelve gallons, or enough for a run of 175 miles over ordinary roads. The car is equipped with a Winton muffler, with relief slide for use on the track when it is desirable to cut out.

Some important changes have been made in the body, which is of air-seasoned lumber, with ash frames and poplar panels, the joints being mortised and secured with screws and glue and all outside joints avoided. The front seat is divided, and each part is large and roomy. The tonneau

will seat three persons comfortably. The back is high and the top of the door is flush with the top line of the tonneau. A seat fits in the door space when the door is closed. The car is upholstered in hand-buffed leather, the cushions having spiral springs of oil tempered steel and curled hair stuffing. In color, the body is a light maroon, while the running gear is glazed carmine, both striped. The continuous laminated wood mud guards are finished in black with carmine striping. A quarter-inch, half round moulding follows the top outside lines of front seats and tonneau, and a half-inch half round moulding forms the mounting of the bonnet board. The handles of the controlling levers, the grips and locks on the tonneau door and the bonnet are of solid brass, while the steering wheel has brass arms or spokes.

The car is equipped with two brass lamps attached to the side of the bonnet board and an imported horn, the bulb of which is attached to the side of the car and connected with the trumpet forward by a flexible metallic tube.

### White Steam Touring Car.

The White Sewing Machine Co., of Cleveland, Ohio, has the model of its touring car completed, but as yet is not ready to give a detailed description of the working parts. The machine is modeled somewhat after the car which was built last summer, but several very substantial changes were made in it. Only one or two of that pattern were ever made. In general outlines the car looks much like the gasoline cars on the market this year.

The machine is equipped with a vertical compound engine, with two sets of cylinders, high and low pressure. The exhaust passes from the low pressure cylinder to the condenser in front and the water is carried back, after going through a cleansing process, and is used again. The gasoline tank, holding ten gallons, is placed in the rear with the water tank, which has a capacity of fifteen gallons. It is estimated that this supply, through the saving made by the condenser, is sufficient to run the car 100 miles over fair roads.

The White Company has followed the general custom of making a long car for the next season, the wheel-base being six feet eight inches, with a length over all of ten feet. The tread is four feet eight inches and the extreme width is five feet. The wheels are of artillery type, thirty-inch, and fitted with four-inch Goodrich tires. The car complete will weigh 1,650 pounds.

There is a possibility that this model will be followed in the racing car, should the White be selected as one of the team for the Gordon-Bennett contest. While it is not known what will be done in the matter, Rollin White, superintendent of the factory, has forwarded his entry to the Automobile Club of America for that purpose. Because the White has made such excellent showings in speed and endurance contests, there is great probability that the entry of the machine will be accepted for that event.

WHITE STEAM TOURING CAR WITH COMPOUND ENGINE.

On account of this, it is impossible now to state what speed the new machine is expected to make, but as it is built along the lines of the racing machine used last summer, some idea of its speed may be deduced. The greatest difference is perhaps heavier and stronger construction in every particular, with a number of improvements which, though of apparently minor importance, will aid in the general running and add accordingly to the speed.

## New Enterprises.

The Reserve Automobile Co., of Camden, N. J., has been chartered with a capital of $50,000 to manufacture all kinds of automobiles.

The Cook Motor Co., of Delaware, has been incorporated by Charles E. and Fred C. Cook, and Leonard D., William S. and John F. Denison.

The Waterloo Motor Works, of Waterloo, Iowa, has been incorporated with authorized capital of $200,000 by Thomas Cascaden and others.

An automobile company capitalized at $400,000 is reported to be projected in Waukegan, where it is expected that a factory will be secured early next year.

The Nichols Kerosene Motor Co., of Wilmington, Del., has been incorporated for $1,000,000 by A. L. Conklin, Jr., and John P. Hayden, of New York, and Horace G. Knowles, of Wilmington.

E. Griswold, of New York City, representing the Townsend Automobile and Piano Works, was in Sag Harbor, Long Island, for some days recently looking for a suitable site for a new factory.

Henry Halsey, William S. Halsey and Howard H. Williams have incorporated the Halsey Electric Generator Co., under the laws of New Jersey, for the purpose of manufacturing batteries, motors and electrical fittings. The authorized capital is $100,000.

The Turbine Electric Truck Co., of Yonkers, N. Y., has been incorporated with $100,000 capital stock to manufacture electric motors. The directors are J. D. Sullivan, H. D. Crippen, J. J. Crippen and William C. Dodge, of New York, and F. A. Curtiss, of Nutley, N. J.

J. C. Reuter, of St. Louis, Chas. L. Jacquelin, of New York city, and Frank P. McDermott, of Jersey City, are the incorporators of the United States Mechanical Appliance Co., with authorized capital of $500,000. The objects are the manufacture of engines, motors and similar articles.

Earle Mason, of the Newport Engineering Co., of Newport, R. I., is reported to be intending to place in the market a new motor vehicle designed by himself for both pleasure and business purposes, and combining French and American designs. It is to be driven by a four-horse power gasoline motor.

The Thermobile Co. of America is the name of a new concern that has been incorporated with $1,000,000 capital stock under the laws of New Jersey, to manufacture appliances to be used in the construction of automobiles, presumably steam. The incorporators are William H. Lake, Z. Wirt and B. M. Bell, all of Chicago. If any deductions are to be drawn from the name and the amount of stock, it might be supposed that the vehicles will be run on hot air and water.

## Trade Brevities.

The New Process Rawhide Co., of Syracuse, has purchased a site on the salt lands and will erect a new factory.

Indianapolis business men are said to be interested in a company that has been organized to establish an automobile line at Anderson, Ind.

The Stearns Steam Carriage Co., of Syracuse, although late in making application, has succeeded in securing space at the Madison Square Garden show in Booth No. 115.

E. K. Ashley, who has been identified with the automobile business since its inception, has accepted the position of general manage of the E. R. Thomas Motor Co., of Buffalo.

The firm of J. E. Shaw & Co., of Lowell, Mass., has gone out of business and F. A. Connor, formerly with them, is now with the Morrison Co., dealers in automobiles in Moody Street, Lowell.

The American Gas Engine Co., for years which did business at Sheboygan Falls, Wis., has removed to Green Bay and will utilize the foundry building owned by A. M. Duncan. The company is capitalized at $50,000.

The Standard Wheel Co., of Terre Haute, Ind., will have one of its new gasoline runabouts ready to show and test by the middle of January, and it is expected that new machines will be turned out in quantity for market by the first of March.

Notices withdrawing all present prices and discounts have been sent by the National Motor Vehicle Co., of Indianapolis, formerly the National Vehicle Co., to all of its agents and representatives. A new schedule of prices goes into effect on January 1.

The Westchester Automobile Co., which conducts an automobile station on Fifth Avenue, New York City, has incorporated with $15,000 capital stock. The directors are Sanford Robinson, L. E. Holden, of New York, and Thomas Holden, Jr., of White Plains, N. Y.

The Century Motor Vehicle Co., of Syracuse, recently sold two steam surreys to C. J. Spittal, of Clarendon, Texas, who is running them between Amarillo and Clarendon, a distance of sixty miles, to carry passengers. His automobile line is in opposition to the stage route.

The General Automobile Mfg. Co., of Cleveland, will show its new touring car for the first time at the New York show. It is a large and roomy, but not extremely heavy machine, and is equipped with a double-cylinder vertical motor placed in front. It is designed to develop about 18 horse power.

William E. Metzger, the Detroit dealer who has recently become sales manager for the Cadillac Automobile Co. of that city, was in Cleveland recently where he completed arrangements for the representation of Cadillac machines, but the parties interested are not yet ready to make their announcement.

Napoleon P. Bliss, of North Attleborough, Mass., is reported to be promoting a new company to manufacture motor vehicles. He is said to have interested capitalists in Providence, Pawtucket, Franklin and Norton, and to have examined a plant at Plainville with a view to starting operations at an early date.

The Winton Motor Carriage Co. has leased a site at the corner of Berkeley and Stanhope Streets, in Boston, for an automobile sale and repair station to be completed by the middle of February. The building is to be 56 by 48 feet and will contain offices, salesrooms, waiting room, sleeping quarters and all modern facilities.

A racing machine is being built by the Matheson Auto Car Co., of Grand Rapids, Mich., in its South Front Street factory, with a view to its use in the Gordon Bennett cup contest provided a preliminary elimination contest is held for the purpose of selecting an American team, in which event C. W. Matheson and J. B. Hedges will enter.

The Syracuse factory, formerly occupied by John S. Leggett as a carriage manufactory, is rapidly being turned into an automobile plant. Machinery is being installed and it is expected that the manufacture of automobiles will be commenced in a few weeks. The company has recently been incorporated under the name of the John S. Leggett Mfg. Co.

The Lynn Automobile Co., which is now fully established in a three-story brick factory building at 306 Broad Street, Lynn, Mass., is preparing to embark in the manufacture of steam and gasoline vehicles. The concern was formerly in Malden, and before that in Springfield. A. E. Eddy, of Springfield, is proprietor, while the shop management is in the hands of S. H. Barrett and his son L. S. Barrett.

The Chaney Automobile Co., of Terre Haute, Ind., has let a contract for the erection of a building 40 by 50 feet on Seventh Street, south of Ohio Street, to be used as an automobile storage and repair station. The company also rents a steam wagonette to excursion parties, picknickers, theater parties and for dances, receptions and similar occasions for which uses it is already becoming popular.

A fully equipped station for the storage and care of automobiles has been opened at 58 Broadway, Buffalo, by David C. McCan. There is room on the main floor for about forty vehicles, and in a rear room is a complete charging outfit for electrics and a washing stand. The repair shop is on an upper floor, reached by a powerful elevator. The floors are of white asphalt and the station is lighted by electricity.

As a testing apparatus for determining whether or not the motors of automobiles are developing the maximum power, the American Storage Co., of New York City, has installed on one of the upper floors of its station a device constructed on the principle of the bicycle home trainer, with rollers for the driving wheels connected with a speedmeter and braking mechanism. The rollers are on a level with the floor.

The National Vehicle Co., of Indianapolis, will on January change its name to the National Motor Vehicle Co. Owing to the organization of several companies in which the word "National" appears in the title, and a possible confusion of identity, attention is called to the fact that the concern mentioned manufactures the National line of electric automobiles and expects to soon place in the market a line of gasoline vehicles under the same trade name.

George M. Dickson has just returned to Indianapolis from a trip to Cuba in the interest of the National Motor Vehicle Co. He reports very few automobiles in use there, owing to local conditions, customs, duties and lack of charging and repair facilities. Future trade in the island should, he thinks, be considerable. Havana has but twelve or thirteen automobiles, several of which are of the steam type. There are but two or three really up-to-date machines in the entire city. Mr. Dickson made arrangements for the representation of National vehicles.

A new rubber tire designed for use on bike wagons and automobiles of the runabout type is being tested by the Stein Double Cushion Tire Co., Akron, Ohio, thus far with good results. The tire is the invention of Charles Stein, and as yet has not been marketed. It is a partially folded circumference of solid rubber slightly more than half an inch in thickness, within and projecting at either edge of which is a layer of heavy fabric. It is by the latter and by means of bolts and especially prepared steel flanges at the edge of the felloe that the tire is held in place.

The Weber Automobile & Cycle Co., of Milwaukee, will take the local agency for the National automobile, now being manufactured by the National Automobile Co., of Oshkosh, Wis. This company is new in the field, but judging from the energetic way in which it is starting, it will be a fixture. Dr. Mugeler, of Boston, is the financial head of the company. Marion Black, for several years with the E. R. Thomas Motor Co., of Buffalo, is the mechanical expert. The company is manufacturing gasoline vehicles, four and two cylinders. Mr. Weber expects the delivery of the first machine within the next ten days.